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# Accounting

## Courses

**ACCT 2301. Principles of Accounting I-Financial. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
An introduction to financial accounting concepts and their application in the accounting process for business organizations. Includes financial statement preparation and analysis and communication of financial information. No previous knowledge of accounting required. Prerequisite: MATH 1314, MATH 1332, MATH 1324, MATH 2412, MATH 2413, MATH 1342, or concurrent enrollment, or approval of department head. Lab fee $2.

**ACCT 2302. Principles of Accounting II-Managerial. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
An introduction to the use of accounting information as an aid to management decision making. Includes budgeting, the control process, the classification of costs, and financial modeling. Prerequisite: ACCT 2301. Lab fee $2.

**ACCT 3300. Accounting Concepts. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of basic accounting principles, concepts, and methods to include a review of general purpose financial statements and the accounting process. Financial accounting procedures are presented to support the overall managerial function. This course is provided for students without a previous accounting background. This course is designed to provide non-BBA students with sufficient introductory accounting to prepare them to survive in an introductory finance course. The coverage is not deep enough in either financial or managerial accounting for any recognized Bachelor of Business Administration (BBA) program. The introductory financial accounting (ACCT 2301) and managerial accounting (ACCT 2302) courses are required for all BBA majors anyway, and would better prepare those students for further studies in Finance. Therefore, credit for both ACCT 3300 and ACCT 2301 will not be permitted by the College of Business Administration.

**ACCT 3301. Business Analysis using Spreadsheets. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
Theory and application of microcomputer technology in the practice of accounting and finance. Emphasis on the utilization of basic spreadsheet and general ledger software. Intended to stimulate creative initiative in performing accounting tasks and to develop the basic skills necessary to efficiently and effectively utilize the microcomputer. Credit for both BCIS 3301 and ACCT 3301 will not be awarded. Prerequisite: ACCT 2301 or ACCT 3300 Lab fee: $2.

**ACCT 3302. Cost Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory cost course, emphasizing the accounting for material, labor, and manufacturing expenses in both job order and process cost systems. Special attention to distribution of service department cost and costing of byproducts and joint products. Prerequisite: ACCT 2302 or approval of department head.

**ACCT 3303. Intermediate Accounting I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The environment of accounting, development of standards, basic theory, financial statements, worksheets, and the application of generally accepted accounting principles for the business enterprise with emphasis on corporations. Prerequisite: ACCT 2301 or approval of department head. Lab fee $5.

**ACCT 3304. Intermediate Accounting II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A continuation of Intermediate I with continued emphasis on generally accepted accounting principles as applied to the business enterprise. Prerequisite: ACCT 3303 or approval of department head. Lab fee $5.

**ACCT 3305. Government and Institutional Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Budgeting, accounting, and financial reporting principles and practices for governmental and other not-for-profit entities. Credit for both ACCT 3305 and ACCT 5307 will not be permitted by the College of Business Administration (the topics covered in these two courses are equivalent from a Texas State Board of Public Accounting standpoint). Prerequisite: ACCT 3303 or approval of department head.

**ACCT 3310. Accounting Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specific study of design and implementation of complex accounting information systems. An understanding of the traditional accounting model and its relationship to each type of accounting information system will be emphasized, including accounts receivable, inventory control, cost accounting, operational budgeting, and capital budgeting. Key elements of a well-designed management control system are included. Prerequisite: ACCT 2302 or approval of department head. Lab fee $15.

**ACCT 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a accounting related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of department head.

**ACCT 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in accounting. May be repeated with approval of department head. Prerequisites: Approval of department head.

**ACCT 4090. Special Topics in Accounting. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An examination of current topics in accounting. Readings required from current accounting publications and other related periodicals. May be repeated for credit when topics vary. Prerequisites: 9 hours in ACCT.

**ACCT 4301. Financial Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of financial statement analysis and accounting topics related to financial statement presentation and disclosure. Prerequisite: ACCT 3304 or approval of department head. Lab fee $5.

**ACCT 4303. Advanced Accounting Principles. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Special phases of partnership accounting, joint ventures, consignments, installment sales, statement of affairs and accounting for insolvent concerns, and business combinations. Prerequisite: ACCT 4301 or concurrent registration. Lab fee $5.

**ACCT 4305. Federal Tax Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The present income tax law and regulations; income tax legislation, treasury and court decisions, departmental rulings; income tax problems and returns, social security, and self-employment taxes. Credit for both ACCT 4305 and 5305 will not be awarded. Prerequisites: ACCT 2302 or approval of department head.

**ACCT 4306. Federal Tax Accounting Advanced. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Current income tax law and tax accounting procedures. Preparation of income tax returns of partnerships and corporations. Credit for both ACCT 4306 and ACCT 5306 will not be awarded.Prerequisite: ACCT 4305 or approval of department head.

**ACCT 4323. Ethics for Accountants. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to auditing and ethical responsibilities for auditors and other accountants in both public and private practice. Topics include generally accepted auditing standards, the standard audit report, legal responsibilities of accountants, the Code of Professional Conduct for accountants, independence, and objectivity. Includes case studies involving ethical reasoning and decision making. Credit for both ACCT 4323 and ACCT 5323 will not be awarded. Prerequisite: ACCT 3304 or concurrent enrollment.

**ACCT 4324. Auditing Evidence and Report. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Procedures used by auditors and accounting practitioners to gather and evaluate information and report on their findings. Includes evaluation of internal control, planning an audit or other engagement, compliance testing, substantive testing, statistical sampling, evaluation of findings, and preparation of reports. Credit for both ACCT 4324 and ACCT 5324 will not be permitted by the College of Business Administration (the topics covered in these two courses are equivalent from a Texas State Board of Public Accounting standpoint). Prerequisite: ACCT 4323.

**ACCT 4385. Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of current issues and developments in accounting. Prerequisite: Approval of department head.

**ACCT 5086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
This course offers students the opportunity to become acquainted with current research being conducted within the student's area of interest; directed reading of a number of sources selected in concert by the student's professor. Prerequisite: Approval of department head.

**ACCT 5300. Foundations of Financial Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An interdisciplinary course that examines principles of accounting, economics and finance as applied to the contemporary business organization operating in a global market place. Focuses on integration of theory and practice to develop framework for measuring, analyzing, and imporving financial performance.

**ACCT 5302. Cost Analysis & Control. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of management control systems, profit performance, standard and direct costing, investment Control, and long-range planning. Students who have successfully completed ACCT 3302 cannot receive credit for this course. Prerequisite: ACCT 2301.

**ACCT 5303. Accounting Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of accounting as related to problems of making business and economic decisions. Includes both financial and managerial accounting. Readings, problems, and cases requiring use of accounting data. Prerequisite: COBA 5101, or equivalent, or department head approval.

**ACCT 5304. Advanced Financial Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An intensive study of theory and practices related to advanced financial accounting topics pertaining to partnerships, joint ventures, consignments, installment sales, insolvent concerns, and business combinations. Students who have successfully completed ACCT 4303 cannot receive credit for this course. Prerequisites: ACCT 3303 and ACCT 3304.

**ACCT 5305. Federal Tax Accounting I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
General concepts of federal income taxation applicable to individuals and business entities. Students who have successfully completed ACCT 4305 cannot receive credit for this course. Prerequisites: ACCT 2301.

**ACCT 5306. Federal Income Tax II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Survey of federal income tax laws applicable to corporations, partnerships and S-corporations, and fiduciary relationships. Students who have successfully completed ACCT 4306 cannot receive credit for this course.

**ACCT 5307. Governmental and Not-for-Profit Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course specialized in financial accounting related to state and local governments and governmental agencies, and not-for-profit organizations. Students who have successfully completed ACCT 3305 cannot receive credit for this course. Credit for both ACCT 3305 and ACCT 5307 will not be permitted by the College of Business Administration (the topics covered in these two courses are equivalent from a Texas State Board of Public Accounting standpoint). Leveling coursework may be required prior to enrollment into this course.

**ACCT 5309. International Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of international accounting within the context of managing multinational enterprises (MNEs). The course will address different countries' accounting issues and International Accounting Standards by IFRIS. Prerequisites: ACCT 3303 or approval by the department head.

**ACCT 5310. Information Systems in Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in-depth study of the application of information systems knowledge to the accounting environment. Emphasis is on developing an understanding the processing of accounting data in a computer environment and the controls necessary to assure accuracy and reliability of the data being processed. Students who have successfully completed ACCT 3310 cannot receive credit for this course. Prerequisite: ACCT 3303.

**ACCT 5311. Managing Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies the management and use of information and technology as a resource to create competitive businesses, manage global operations, provide useful products and quality services to customers, whether public or private. Examines unformation systems management, intellectual property, privacy, organizational and societal impact, legal issues, ethics, security issues, decision making, strategic information systems, and management and organizational support systems. Prerequisites: BCIS 5301 or approval of department head.

**ACCT 5315. Estate and Gift Tax. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is intended to provide students with a general understanding of the fundamental principles of the United States estate and gift tax system. Students will (i) learn basic principles and concepts of estate planning, (ii) learn the theoretical basis of the U.S. approach to estate and gift taxation and (iii) gain detailed knowledge of estate and gift tax issues. In addition, the course will prepare students to anticipate, recognize, and manage various issues that arise in the transfer tax system.

**ACCT 5323. Business & Professional Ethics for Accountants. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of moral and ethical issues within the accounting profession and the broader business environment. Along with a general study of ethical behavior and decision making, various professional codes of conduct within the accounting profession will be examined with emphasis on accountants' integrity, independence and objectivity, and legal liability. Students who have successfully completed ACCT 4323 cannot receive credit for this course. Credit for both ACCT 4323 and ACCT 5323 will not be awarded. Prerequisite: ACCT 3304 or concurrent enrollment.

**ACCT 5324. Auditing and Professional Responsibility. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of financial auditing standards and procedures. Theory and practice are combined to enable the student to better understand how audits are conducted and to prepare students for the CPA examination. Students who have successfully completed ACCT 4324 cannot receive credit for this course. Credit for both ACCT 4324 and ACCT 5324 will not be permitted by the College of Business Administration (the topics covered in these two courses are equivalent from a Texas State Board of Public Accounting standpoint). Leveling coursework may be required prior to enrollment into this course.

**ACCT 5325. Forensic Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will cover: types of fraud schemes; how fraud is detected and investigated; legal aspects of fraud; and how to prevent fraud in the workplace. Prerequisite: ACCT 5324.

**ACCT 5335. Analysis of Financial Statement Information. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of financial statement analysis and accounting topics related to financial statement presentation and disclosure. Prerequisites: ACCT 3304 or approval of department head.

**ACCT 5357. Accounting Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A systematic study of generally accepted accounting principles and rules that govern the practical application of accounting methods. Prerequisites: ACCT 3303 and 3304.

**ACCT 5385. Accounting Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected accounting topics of current importance to business management. May be repeated once for credit when topics vary.

**ACCT 5390. Selected Topics in Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different financial, managerial, governmental, and not-for-profit topics in Accounting . The course may be repeated for credit as the topic changes. Prerequisites: ACCT 3303 or approval by the department head.

# Agricultural Communications

## Courses

**ACOM 1110. Introduction to Agricultural Communication. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Focuses on the fundamentals of agricultural news writing and other communication methods. Students will learn about the history and practice of agricultural communication, the role of the media in agriculture and related fields, and careers.

**ACOM 2301. Digital Photography Techniques for Agriculture. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course focuses on the fundamentals of Digital Photography and image editing in an agricultural setting. Topics will include livestock, wildlife, event, and portrait photography as they relate to the field of agriculture.

**ACOM 2307. Graphic Design and Layout for Agricultural Publications. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Fundamentals of layout and design as applied to agricultural publications, such as brochures, newsletters, magazine and advertising layouts, and social media. Practical application of design principles, typography, desktop-publishing software and printing practices.

**ACOM 3314. Writing and Editing for Agricultural Publications. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Writing and editing in agricultural industries and publications. Writing agricultural articles, tightening copy, editing, copy reading, writing headlines, writing photo captions.

**ACOM 3321. Communicating Agriculture to the Public. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is an application of public relations writing and skills in an agricultural context. Agricultural organizations can be government-related, for-profit business, or not-for-profit commodity groups. Whatever the organization classification, they must communicate internally, among each other, and to a larger audience. This course will equip you with an understanding of public relations and help develop necessary skills to be successful communicators for the industry.

**ACOM 4086. Problems in Agricultural Communications. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 0 Hours).**
Individualized study of current topics in student's major concentration of study or supporting discipline. Specific content and credit dependent upon students' interest, needs, and depth of study. Maximum undergraduate credit, four semester hours. Prerequisite: Senior classification and advanced approval by academic advisor.

**ACOM 4305. Publication Development in Agricultural Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides directed experience in the development of a commercial agricultural publication. Students will master public relations writing style, interviewing and photography skills, and sponsorship sales techniques in an agricultural context. Prerequisite: completion of COMM 2311 with a grade of 'C' or better and senior classification.

**ACOM 4320. Advanced Technology in Agricultural Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of various topics, trends, technologies, and best practices in the field of Agricultural Communication. Students will work both independently and in teams to apply critical thinking and creative problem solving skills to address real-world challenges.

**ACOM 4350. Electronic Field Production for Agricultural Communications. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course provides directed experience in agricultural television field production and electronic news gathering. Students will master video production skills such as script writing, storyboarding, camera operation, and video editing in an agricultural setting.

**ACOM 4390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics in Agricultural Communications. May be repeated for credit when topics vary. Prerequisite: Senior classification or approval of department head.

**ACOM 4684. Internship. 6 Credit Hours (Lecture: 0 Hours, Lab: 16 Hours).**
Pre-approved and supervised work experience in an administrative systems-related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisites: Junior classification and approval of department head. Field experience fee $50.

# Agri and Consumer Resources

## Courses

**ACRS 5086. Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Studies related to agricultural education, extension, service and development, international programs, and policies affecting agriculture. Prerequisite: Approval of the instructor.

**ACRS 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when student is ready to begin the thesis. No credit until thesis is accepted. Prerequisite: Approved research methodology course and consent of major professor.

**ACRS 5302. Leadrshp for Agri & Consum Res. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study and application of leadership theories and styles related to functioning in agricultural and consumer resources leadership positions.

**ACRS 5306. Instruction in Agricultural Mechanics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Field based applications and methods of teaching agricultural mechanics. This course will emphasize the organization, management, service, and use of equipment in the instruction of agricultural mechanics. Students will also apply research methodology specific to appropriate topics.

**ACRS 5307. Agricultural Education Programs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the secondary school agricultural education program. Topics include pre-employment, work-based learning, advisory committees, supervised agricultural experience programs, student leadership through FFA, and new program development. Students will also apply research methodology specific to appropriate topics.

**ACRS 5310. Programmatic Leadership Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Field-based experiences designed to develop leadership ability for teaching, entrepreneurship, and conducting adult and youth organizations. Includes systems of record keeping. Students will also apply research methodology specific to appropriate topics.

**ACRS 5311. Info Systems to ACR. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of information systems used in agricultural services and development. A study of the flow of information in and among various components of the agri-education/industry/business sectors.

**ACRS 5313. Adm & Supv of Career & Tech Ed. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theories and procedures applicable to the organization, administration, financing, and supervision of career and vocational-technical education in public and post-secondary schools. Prerequisites: Professional experience or approval of the instructor.

**ACRS 5316. Prog Bldg in Career/Tech Ed. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Organization of educational programs in agriculture and family and consumer sciences on local, state, national and international levels. Prerequisite: Professional experience or approval of the instructor.

**ACRS 5318. Ethical/Env Iss Agri & Con Res. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Ethical and environmental issues affecting public policy as related to agricultural and consumer resources areas, such as agricultural education, family and consumer sciences' education, AgriLife extension education, agricultural business and industry. Credit for both ANSC 5318 and A ED 518 will not be awarded. Prerequisite: Approval of instructor.

**ACRS 5319. Prof Dev Agri & Consum Res. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected programs in agricultural education, AgriLife extension, service, development, international, or family & consumer sciences programs. Also will serve as state certifying course for cooperative part-time teacher preparation as topic justifies. Prerequisite: Professional experience or apporval of instructor. May be repeated for credit.

**ACRS 5320. Prg& Pers Coop TX Agri Ext Ser. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Enabling legislation, program areas, teaching methods used, staffing patterns, funding, and program administration of the Cooperative Extension Service. Special emphasis on entry-level positions and responsibilities of each.

**ACRS 5321. Int'l Prog Ag & Cons Resour Ed. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The function of international agencies, organizations, foundations, religious groups, and education concerning the improvement of the quality of life for peoples in developing nations through improved, sustained agricultural production and consumer resources understanding and application. Prerequisite: Admission to College of Graduate Studies.

**ACRS 5330. Teaching Agriculture at the Postsecondary Level. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Methods and techniques of teaching agricultural subjects at the college/university level. Topics include course preparation, presentation, evaluation and post-secondary educational philosophy.

**ACRS 5331. Professional Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced discussion of techniques for communicating technical information to diverse audiences. Topics covered will include written and oral communication, using numerous formats. Prerequisite: Graduate standing.

**ACRS 5340. Methods of Tech Change. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Methods of planning and implementing change in agricultural and consumer resources techniques and practices. Special emphasis on the role of the agricultural and family and consumer sciences' change agents and the effects of change on society and the economy. Prerequisite: Approval of the instructor.

**ACRS 5350. Advanced Animal Related Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specialized feeding, training, and fitting livestock for utilization in the approved agricultural education program. Topics include identifying, selection, and evaluating all aspects of the livestock and stock-show industries. Students will also apply research methodology specific to appropriate topics.

**ACRS 5360. Advanced Electronic Field Production for Agricultural Communications. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course provides advanced experience in agricultural television field production and electronic news gathering. Students will master video production skills such as script writing, storyboarding, camera operation, and video editing in an agricultural setting. Students will act as executive producers working with undergraduates enrolled in ACOM 4350.

**ACRS 5380. Agriculture and Food Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of agriculture and food policy at the state and national levels. Topics include a history of the legislative process, current agricultural issues, and the place of agriculture in the American political system. Graduate students will work in extracurricular policy and commodity groups. Prerequisite: Graduate status.

**ACRS 5385. Intro Seminar Agri & Con Res. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Group study and discussion of current developments in graduate education related to agricultural and consumer resources. Special emphasis given to development and maintenance of professional relationships and responsibilities in conducting a graduate education experience. Prerequisite: Graduate classification.

**ACRS 5390. Advanced Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics in agricultural education offered as needed and dependent upon departmental, faculty, and student interest. May be repeated as topics vary.

**ACRS 5396. Analysis of Social Research Data. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide instruction and application in analyzing information specific to social research in agricultural and consumer resources. The students will calculate measures utilized in descriptive, correlational, and differential statistics. Students will also format data, build syntax commands, and interpret output from SPSS programs.

**ACRS 5397. History, Philosophy, & Policy of Agricultural & Extension Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course is an investigation in philosophical perspectives that shaped the current theories and practices of agricultural and extension education. Students will research and report on specific historical events, legislation, and pioneers that shaped agricultural and extension education policy.

**ACRS 5398. Philo, Interp, Appl, of Res. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies designed to acquaint students in agricultural research techniques and demonstration related to the classroom, laboratories, work experience, and extension and adult education activities in agricultural programs. Basic concepts concerning interpretation and analysis of research data.

**ACRS 5399. Agricultural and Consumer Resources Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in agricultural and consumer resources education/clinical teaching/AgriLife extension/industry/business settings. Emphasis is placed on the student's involvement in successful practices in the area of professional interest. Experience may be on the local, state, national, or international level. May be repeated once for credit. Prerequisite: graduate standing.

# Administration

## Courses

**ADMS 1305. Intermediate Keyboarding. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will master the alpha-numeric computer keyboard by touch, with attention to accuracy and the correct formatting of business documents such as letters, memorandums, formal reports, forms, and other business correspondence. Prerequisite: Beginning typewriting in high school or college.

**ADMS 3314. Advanced Document Production. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will prepare high-quality documents using the computer. Prerequisite: ADMS 1305.

**ADMS 3315. Word Processing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Orientation to word processing concepts terminology, procedures, and hardware. Students are given experience with basic and advanced functions of dedicated word processors and microcomputer word processing software. Prerequisite: Approval of department head.

**ADMS 3316. Advanced Word Processing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A comprehensive study of microcomputer word processing software. Students will develop proficiency in the use of word processing software through extensive hands-on experience with advanced formatting functions including macros, graphics, drawing, merging, and sorting to create documents with columns, tables, and charts. Prerequisite: ADMS 3315 or approval of department head.

**ADMS 3318. Current Issues in Business Operations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of current topics to acquaint the business student with a variety of technological changes encountered in the business environment. Prerequisite: Junior classification.

**ADMS 3319. Current Issues in Business Operations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Examination of a variety of contemporary issues affecting business operations in the areas of accounting, finance, business communication, business law, management, marketing, and economics. Prerequisite: Junior classification.

**ADMS 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in administrative systems. May be repeated with department head approval. Prerequisites: Senior classification and approval of department head.

**ADMS 4313. Administrative Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Business information and decision support systems are examined as critical elements in business data and information systems. Emphasis is placed on data and records management systems, electronic filing and retrieval systems, reprographics systems, telecommunication systems, and machine transcription systems. The course includes discussion of current and future technological trends. Prerequisite: Junior classification.

**ADMS 4314. Administration of the Electronic Office. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of office management, including planning, organizing, staffing, directing, and controlling are examined. Emphasis is placed on improved managerial performance, including procedures, personnel requirements, and equipment needs. Prerequisite: Junior classification.

# Alternative Dispute Resolution

## Courses

**ADRI 4341. Mediation - Methods of Dispute Resolution. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the principles and methods of mediation and dispute resolution. Students will develop mediation skills and become familiar with the mediation process, the ethics of mediation, and various models of mediation.

**ADRI 5341. Mediation-Methods of Dispute Resolution. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the principles and methods of mediation and dispute resolution. Students will develop mediation skills and become familiar with the mediation process, the ethics of mediation, and various models of mediation.

**ADRI 5343. Advanced Mediation Strategies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an advanced alternative dispute resolution principles and methods of mediation and dispute resolution. Students will develop mediation skills and become familiar with the mediation process, the ethics of mediation, and various models of mediation with a focus of family dynamics and the parent-child relationship Prerequisite: ADRI 5341.

**ADRI 5344. Effective Communication Skills for ADR Specialists. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will develop the student's written and verbal skills which will be necessary for effective communication in the mediation and arbitration environment. The course includes document preparation, and interpretation, pre-mediation report evaluation, and effective internet and social media communication in the ADR (Alternative Dispute Resolution) environment.

**ADRI 5345. Arbitration-Methods of Alternative Dispute Resolution. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Arbitration involves an impartial third party responsible for collecting facts, interviewing witnesses and parties, weighing evidence and arriving at a just and appropriate decision given all the circumstances and facts. Upon completion, individuals are certified as Qualified Arbitrators, and able to provide all arbitration services as recognized by the State Bar of Texas and other state and federal jurisdictions.

**ADRI 5346. Advanced Arbitration Theory and Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced Arbitration Theory and Methods will provide the student the opportunity to develop critical thinking skills and demonstrate competencies involved with complex legal issues as an impartial third party responsible for collecting facts, interviewing witnesses and parties, weighing evidence and arriving at a just and appropriate decision given all the circumstances and facts. Prerequisite: ADRI 5345.

**ADRI 5347. Negotiations and Collective Bargaining. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In this course students will examine the practical aspects of negotiations, collective bargaining, motives of participants, the labor contracts; strategy and tactics of bargaining as it applies to the world of Criminology and Criminal Justice. Emphasis will be on negotiations and collective bargaining in both unions and bargaining in the private sector and a special focus on Ethics. This course is intended to give students an understanding of why collective bargaining occurs, the nature and complexity of its operation, what effects it has on workers, organizations, and consumers, and how it fits into the American economic, political, and social systems. Credits will not be awarded for both ADRI 5347 and ADRI 6347. Prerequisite: ADRI 5341.

**ADRI 5384. Mediation Practicum/Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an application of the skills learned in the Basic Mediation and Advanced Mediation courses. Students will participate in 'live' mediation settings to enhance their ability to conduct mediations and practice using the principles and methods of mediation. Students will be able to demonstrate and develop mediation skills and become familiar with the mediation process, the ethics of mediation, and various models of mediation. Credits will not be awarded for both ADRI 5384 and ADRI 6384. Prerequisites: ADRI 5341 and ADRI 5343.

**ADRI 5390. Independent Study. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specific topic and contents of the course will be determined by the student in consultation with the instructor, with whom the student meets regularly for supervision of the study. May be repeated to a maximum of six semester hours. Permission of the graduate advisor required. Prerequisite: Instructor permission.

**ADRI 6341. Mediation-Methods of Dispute Resolution. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the principles and methods of mediation and dispute resolution. Students will develop mediation skills and become familiar with the mediation process, the ethics of mediation, and various models of mediation. Credit will not be awarded for both ADRI 5341 and ADRI 6341.

**ADRI 6343. Advanced Mediation Strategies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an advanced alternative dispute resolution principles and methods of mediation and dispute resolution. Students will develop mediation skills and become familiar with the mediation process, the ethics of mediation, and various models of mediation with a focus of family dynamics and the parent-child relationship. Credit will not be given for both ADRI 5343 and ADRI 6343. Prerequisites: ADRI 5341 or ADRI 6341.

**ADRI 6344. Effective Communication Skills for ADR Specialists. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will develop the student's written and verbal skills which will be necessary for effective communication in the mediation and arbitration environment. The course includes document preparation, and interpretation, pre-mediation report evaluation, and effective internet and social media communication in the ADR (Alternative Dispute Resolution) environment. Credit will not be allowed for both ADRI 5344 and ADRI 6344.

**ADRI 6345. Arbitration-Method of Alternative Dispute Resolution. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Arbitration involves an impartial third party responsible for collecting facts, interviewing witnesses and parties, weighing evidence and arriving at a just and appropriate decision given all the circumstances and facts. Upon completion, individuals are certified as Qualified Arbitrators, and able to provide all arbitration services as recognized by the State Bar of Texas and other state and federal jurisdictions. Credit will not be awarded for both ADRI 5345 and ADRI 6345.

**ADRI 6346. Advanced Arbitration Theory and Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced Arbitration Theory and Methods will provide the student the opportunity to develop critical thinking skills and demonstrate competencies involved with complex legal issues as an impartial third party responsible for collecting facts, interviewing witnesses and parties, weighing evidence and arriving at a just and appropriate decision given all the circumstances and facts. Credit will not be awarded for both ADRI 6346 and ADRI 5346. Prerequisites: ADRI 5345 or ADRI 6345.

**ADRI 6347. Negotiations and Collective Bargaining. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In this course students will examine the practical aspects of negotiations, collective bargaining, motives of participants, the labor contracts; strategy and tactics of bargaining as it applies to the world of Criminology and Criminal Justice. Emphasis will be on negotiations and collective bargaining in both unions and bargaining in the private sector and a special focus on Ethics. This course is intended to give students an understanding of why collective bargaining occurs, the nature and complexity of its operation, what effects it has on workers, organizations, and consumers, and how it fits into the American economic, political, and social systems. Credit will not be allowed for both ADRI 5347 and ADRI 6347 Prerequisite: ADRI 5341 or ADRI 6341.

**ADRI 6384. Mediation Practicum/Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an application of the skills learned in the Basic Mediation and Advanced Mediation courses. Students will participate in 'live' mediation settings to enhance their ability to conduct mediations and practice using the principles and methods of mediation. Students will be able to demonstrate and develop mediation skills and become familiar with the mediation process, the ethics of mediation, and various models of mediation. Credit will not be awarded for both ADRI 6384 and ADRI 5384. Prerequisites: ADRI 5341 or ADRI 6351 and ADRI 5343 or ADRI 6343.

# Agricultural Economics

## Courses

**AGEC 1309. Microcomputer Applications in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Microcomputer technology applied to management, record keeping, and agribusiness. Emphasis on the application of database, spreadsheet, and other business software in various agricultural environments. Lab fee: $2.

**AGEC 2305. Consumer Issues & Decision Making. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Designed to make the student an intelligent consumer of goods and services and to understand consumer decision#making in the marketplace. Major influences on consumer problems, fraud, protection, and consumer behavior.

**AGEC 2317. Introductory Agricultural Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to economics principles and concepts in agriculture today as they relate to the American economic system. Emphasis will be on management problem-solving techniques under various situations, especially those agricultural in nature,including producing, processing, distributing, and consuming farm and ranch products.

**AGEC 3312. Production Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Application of economic production principles in solving resource allocation problems in agriculture and agribusiness. Prerequisites: MATH 1324 or MATH 1325, and either AGRI/AGEC 2317 OR ECON 2302, or permission of instructor.

**AGEC 3314. The Agricultural Marketing System. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory course covering the principles, practices, institutions, functions, and problems involved in the marketing of agricultural commodities. Prerequisite: AGRI 2317/AGEC 2317 or ECON 2302.

**AGEC 3317. Agricultural Statistics. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Statistical principles and methods in analyzing agricultural and economic data to solve problems relating to production, consumption, and cost/profit optimization. Provides a basic background in statistical analysis and related computer applications. Prerequisite: MATH 1314 or higher, or approval of instructor. Lab fee: $2.

**AGEC 3330. Agricultural Credit. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Emphasis will be on building Balance Sheets, Income/Expenses Statements, Collateral Analysis, Credit Action Forms and Financial Analysis. Prerequisites: AGRI 2317/AGEC 2317 and MATH 1314 or higher, or approval of instructor.

**AGEC 3333. Agriculture Prices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Factors affecting commodity prices, price trends and seasonal variations, parity prices, methods of forecasting demand and prices, and economic tools and techniques for making decisions. Prerequisites: AGRI 2317/AGEC 2317, AGRI 1309/AGEC 1309, and AGEC 3314. Lab fee $15.

**AGEC 3359. Personal & Family Financial Management I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Special emphasis is given to the use of individual and family planning, management and purchasing decisions in achieving financial goals, within the context of the family life cycle. Credit for both AGEC 3359 and FACS 3359 will not be awarded. Prerequisites: AGEC/AGRI 2317 or equivalent, or approval of department head.

**AGEC 3360. Personal & Family Financial Management II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Emphasis on Insurance Planning and Risk Management, Investment Planning, Retirement and Estate Planning within the context of the family life cycle. Credit for both AGEC 3360 and FACS 3360 will not be awarded. Prerequisite: AGEC/AGRI 2317 or equivalent, or approval of department head.

**AGEC 4086. Agricultural Economics Problems. 1-4 Credit Hours (Lecture: 0 Hours, Lab: 1-4 Hours).**
Individualized study of current topics in student's major concentration of study or supporting discipline. Specific content and credit dependent upon student's interest, needs, and depth of study. Maximum undergraduate credit, four semester hours. Prerequisite: Senior classification and advance approval by instructor of record.

**AGEC 4088. Undergraduate Research. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
Fundamental research methods will be addressed through a faculty-directed project. Participation in an abbreviated lecture series may be required. Project components may include a literature review, data collection and analysis, testing, planning, project design, and/or computer modeling. The student is required to prepare a final report and produce a presentation. No credit is awarded until the the report and presentation are submitted. Only one undergraduate research experience will be counted toward degree requirements. Prerequisite: Junior Standing, completion of 12 hours in AGEC, and approval of department head.

**AGEC 4090. Special Topics. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Special Topics. (Credit-variable) Deals with selected topics in agriculture or agribusiness. May be repeated for credit when topics vary, with a maximum of six hours. Prerequisite: Approval of department head.

**AGEC 4301. Public Agricultural Food Programs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Identification and analysis of alternative governmental programs and policies affecting prices and quantities of agricultural commodities, farmer-rancher incomes, food supplies and consumer prices, and domestic and foreign food distribution and trade. Consideration of relevant political and economic factors, administrative aspects, and the policy participants. Prerequisites: AGRI 2317/AGEC 2317 or two semesters of economics and junior classification.

**AGEC 4302. International Trade and Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Role of U.S. agriculture in a dynamic world economy; national and international policies, institutions, exchange rates, tariffs, and non-tariff barriers that impact US agribusiness trade. Prerequisites: AGEC 2317 or 3 hours of economics and junior or senior classification. Prerequisite: AGEC 2317 or 3 hours of economics and junior or senior classification.

**AGEC 4306. Commodity Futures Markets. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the organization and functioning of futures markets. Analysis of the economic function performed by markets, and study of fundamental and technical approaches to market forecasting. Examination of various trading strategies applied primarily to agricultural commodities. Prerequisites: AGRI 2317/ AGEC 2317 or ECON 2302; AGRI 1309/AGEC 1309 and AGEC 3314.

**AGEC 4321. Regional Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Analysis of regional/community economic problems in the United States. Application of economic principles and theory to regional/community development. Evaluation of current methods and public programs for economic development. Application of analytical methods to development problems. Credit for both AGEC 4321 and ECON 4321 will not be awarded. Prerequisite: AGEC 2317/AGRI 2317 or ECON 2302.

**AGEC 4325. Recreation and Tourism Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Benefit-cost frameworks in public planning for outdoor recreation development, pricing problems, market demand assessment, and impacts of recreational development on regional economies. Prerequisites: ECON 2301, and either AGEC/AGRI 2317 or ECON 2302.

**AGEC 4330. Agricultural Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of the capital requirements for farming and ranching; principles involved in the use of each type of farm credit. Prerequisites: Senior classification, AGEC 3330, and one semester of accounting, or approval of instructor.

**AGEC 4333. Economics of Agribusiness Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Economic aspects of the agribusiness system. Management techniques related to problem recognition and decision making in organizations involved in the agricultural sector. Prerequisites: AGEC 2317/AGRI 2317 or ECON 2302 and AGEC 3314.

**AGEC 4335. Farm Appraisal. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Techniques for evaluating the market value of agricultural real estate using three common approaches: sales comparison, cost, and income. Analyzing effects of different farm characteristics on farm value. Prerequisite: AGEC 3330 or AGEC 4330.

**AGEC 4350. Natural Resource Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Natural resource availability, use, conservation, and government policy relevant to crop and livestock production. Current and emerging natural resource issues affecting production agriculture and agribusiness firms. Evaluation of the farm economic impacts of natural resource policies at the state and federal levels. Prerequisites: AGEC 2317 or ECON 2302 and Junior or Senior classification.

**AGEC 4370. Family and Economic Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Designed to further students' knowledge about basic family financial management,financial literacy, and household economic issues including non#financial resources such as time. Topics include aging, spouses' work, and other life events. Credit for both AGEC 4370 and FACS 4370 will not be awarded.

**AGEC 4384. Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An approved, supervised, comprehensive work experience consisting of a minimum of 240 hours(6 weeks) for career preparation in an agribusiness enterprise. Prerequisites: Junior or Senior classification and approval of academic advisor and department head.

**AGEC 5086. Agricultural Economics Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Advanced independent study and research in agricultural economics topics. A written report will be submitted to the supervising professor. Prerequisite: Approval of instructor of record.

**AGEC 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when student is ready to begin the thesis. No credit until thesis is accepted. Prerequisites: Approved research methodology course and consent of major professor.

**AGEC 5301. Environmental Issues and Agricultural Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Current and emerging problems in economics of environmental issues relating to agriculture and agribusiness firms. Examination of policy issues, institutions, and legal and political constraints in relation to environmental quality and agricultural resources. Prerequisites: ECON 2301 and 3302, or approval of instructor of record.

**AGEC 5310. Advanced Farm and Ranch Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Economic theory and business principles applied to the organization and operation of farm and ranch businesses. Emphasis will be on farm budgeting and decision making, selecting and combining enterprises, analyzing farm investment alternatives, farm growth strategies, risk, and uncertainty. Prerequisites: AGEC 3314. Lab fee: $6.

**AGEC 5312. Production & Operations Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of the production and operations function from a problem-solving and quantitative models approach. Prerequisite: Approval of instructor of record.

**AGEC 5314. Advanced Agricultural Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Market development concepts, practices, and strategies for food and fiber products. Causes, effects, and relationships to business and consumer economics. Strategies for price risk management in buying and selling agricultural products. Prerequisites: ECON 3302 and AGEC 3314, or approval of instructor of record.

**AGEC 5333. Management Practices of Agribusiness. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the choices, decisions, strategies and organizational behavior of agribusiness firms and their management. Primary emphasis will be given to the managerial practices of food and agricultural supply firms in the agri-food industry. Prerequisites: AGEC 4330 or equivalent FINC course, AGEC 314 or MKTG 314, and MGMT 3301, or approval of instructor of record.

**AGEC 5390. Advanced Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies in mathematical economics, input-output analysis, linear programming, social benefit-cost analysis, risk management, or other advanced topics as offered. Prior academic training requirements vary with topic. May be repeated once as topic varies. Prerequisite: Consent of instructor.

**AGEC 5396. Analysis of Social Research Data. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Application of contingency tables, and descriptive, differential, and correlational statistics to social research data. Data formatting, syntax operations, procedure options, and interpretation of statistical program output.

**AGEC 5399. Agricultural and Consumer Resources Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in agricultural and consumer resources education/clinical teaching/AgriLife extension/industry/business settings. Emphasis is placed on the student's involvement in successful practices in the area of professional interest. Experience may be on the local, state, national, or international level. May be repeated once for credit. Prerequisites: Graduate standing.

# Aerospace Studies

## Courses

**AEST 1101. Foundation of the US Air Force I. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Air Force AEST 1101 in the fall and AEST 1102 in the spring: A survey course designed to introduce students to the U.S. Air Force and Air Force ROTC. Featured topics include: mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, group leadership problems, and an introduction to communication skills. Leadership Laboratory L100 must be taken and complements this course by providing cadets with followership experiences.

**AEST 1102. Foundation of the US Air Force II. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Air Force AEST 1101 in the fall and AEST 1102 in the spring: A survey course designed to introduce students to the U.S. Air Force and Air Force ROTC. Featured topics include: mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, group leadership problems, and an introduction to communication skills. Leadership Laboratory L100 must be taken and complements this course by providing cadets with followership experiences.

**AEST 2101. Evolution of US Air & Space Power I. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Air and Space Power (AEST 2101 in the fall and AEST 2102 in the spring): A survey course designed to examine general aspects of air and space power through a historical perspective. Utilizing this perspective, the course covers a time period from the first balloons and dirigibles to the space-age global positioning systems of the Persian Gulf War. Historical examples are provided to extrapolate the development of Air Force capabilities (competencies), and missions (functions) to demonstrate the evolution of what has become today's USAF air and space power. Furthermore, the course examines several fundamental truths associated with war in the third dimension: e.g. Principles of War and Tenets of Air and Space Power. As a whole, this course provides the student with a knowledge level understanding for the general element and employment of air and space power, from an institutional, doctrinal, and historical perspective. In addition, the students will continue to discuss the importance of the Air Force Core Values with the use of operational examples and historical Air Force leaders and will continue to develop their communication skills. Laboratory L100 must be taken and complements this course by providing cadets with followership experiences.

**AEST 2102. Evolution of US Air & Space Power II. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Air and Space Power (AEST 2101 in the fall and AEST 2102 in the spring): A survey course designed to examine general aspects of air and space power through a historical perspective. Utilizing this perspective, the course covers a time period from the first balloons and dirigibles to the space-age global positioning systems of the Persian Gulf War. Historical examples are provided to extrapolate the development of Air Force capabilities (competencies), and missions (functions) to demonstrate the evolution of what has become today's USAF air and space power. Furthermore, the course examines several fundamental truths associated with war in the third dimension: e.g. Principles of War and Tenets of Air and Space Power. As a whole, this course provides the student with a knowledge level understanding for the general element and employment of air and space power, from an institutional, doctrinal, and historical perspective. In addition, the students will continue to discuss the importance of the Air Force Core Values with the use of operational examples and historical Air Force leaders and will continue to develop their communication skills. Laboratory L100 must be taken and complements this course by providing cadets with followership experiences.

**AEST 3301. Leadership Studies I. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
AEST 3301 is a study of leadership, management fundamentals, professional knowledge, leadership ethics and the communication skills required of a junior military officer. Case studies are used to examine leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. Course objective is for student to comprehend and apply the concepts of ethical behavior as well as comprehend the selected concepts, principles and theories of leadership and management. Laboratory L100 must be taken and consists of activities classified as leadership and management experiences. It involves the planning and controlling of military activities of the Cadet Corps; and the preparation and presentation of briefings and other oral and written communications.

**AEST 3302. Leadership Studies II. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
AEST 3302 builds upon the concepts established in AEST 3301. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. Course objective is for the student to comprehend and apply the concepts of conflict management, mentorship and counseling in a military environment, understand the principles of leadership authority and responsibility as it pertains to the military officer. Laboratory L100 must be taken and consists of activities classified as leadership and management experiences. It involves the planning and controlling of military activities of the Cadet Corps; and the preparation and presentation of briefings and other oral and written communications. Prerequisite: AEST 3301 or permission of the instructor.

**AEST 4301. National Security Affairs I. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Course is designed to examine the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest focus on the military as a profession, officership, military justice, civilian control of the military and current issues affecting military professionalism. Course objective is for student to comprehend basic elements of national security policy, Air Force functions and competencies and role of the military as it pertains to national security policy. Laboratory L100 must be taken and consists of activities classified as leadership and management experiences. It involves the planning and controlling of military activities of the Cadet Corps; and the preparation and presentation of briefings and other oral and written communications.

**AEST 4302. National Security Affairs II. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
AEST 4302 builds upon the concepts established in AEST 4301. Course is designed to examine the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest focus on responsibility, authority and functions of an Air Force Commander, the military Major Commands Area of Responsibilities, basic introduction of military law and the Code of Conduct. Laboratory L100 must be taken and consists of activities classified as leadership and management experiences. It involves the planning and controlling of military activities of the Cadet Corps; and the preparation and presentation of briefings and other oral and written communications. Prerequisite: AEST 4301 or permission of the instructor.

**AEST L100. Leadership Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 1 Hour).**
Leadership Lab (LLab) is the "hands-on" leadership training portion of the Air Force ROTC program. The Leadership Lab (LLab) also includes studying the environment of an Air Force officer and learning about areas of opportunity available to commissioned officers. The AEST3000 and AEST4000 LLabs consist of activities classified as leadership and management experiences. They involve the planning and controlling of military activities of the cadet corps; and the preparation and presentation of briefings and other oral and written communications. LLabs also include interviews, guidance, and information which will increase the understanding, motivation, and performance of other cadets. (This course is only offered as P/NC.).

# Agriculture and Natural Resources

## Courses

**AGNR 1188. Introduction to Research. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Fundamentals of conducting scientific research in agriculture and natural resources. Overview of project development, design, methodology, ethics, and reporting.

**AGNR 4088. Undergraduate Research. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
Scientific research under the direction of an assigned faculty mentor. Components of the research project may include, but are not limited to, review of literature, project design, data collection, chemical analysis, data analysis, and synthesis of results for dissemination.

**AGNR 4199. Undergraduate Research Forum. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Synthesis of research results, composition of scientific writing, and presentation of undergraduate research to departmental faculty.

# Agriculture

## Courses

**AGRI 1107. Agronomy Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
This laboratory-based course accompanies AGRI 1307. Laboratory activities will reinforce the fundamental principles in the development, production, and management of field crops including growth and development, climate, plant requirements, pest management, and production methods. Prerequisite: AGRI 1307 or concurrent enrollment.

**AGRI 1307. Agronomy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles and practices in the development, production, and management of field crops including growth and development, climate, plant requirements, pest management, and production methods.

**AGRI 1309. Microcomputer Applications in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Microcomputer technology applied to management, record keeping, and agribusiness. Emphasis on the application of database, spreadsheet, and other business software in various agricultural environments. Lab fee $2.

**AGRI 1311. Dairy Science. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A survey of the dairy industry, dairy breeds, standards for selection and culling, herd replacements, feeding, management, and health maintenance. The food value, composition and quality, utilization, and processing of market milk and dairy products will be discussed.

**AGRI 1419. General Animal Science. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The scientific study of animal agriculture involving beef cattle, dairy cattle, swine, sheep, goats, and horses. Topics covered will include general management practices, reproduction, nutrition, health, handling, genetic selection, shelter/housing and marketing strategies and procedures. Lab fee: $2.

**AGRI 2301. Agricultural Power Units. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Fundamentals of internal combustion engine operation to include gasoline, diesel, and liquefied petroleum. Preventative maintenance and general servicing of tractor engine systems: intake & exhaust; fuel; lubrication; cooling; electrical; power trains; and hydraulic. Also covered are tractor tune-up; small engine operation maintenance & reconditioning; and plumbing & irrigation power systems. Lab fee $15.

**AGRI 2303. Agricultural Construction I. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
A course designed to acquaint students with principles and application of carpentry, tool maintenance, tool and hardware nomenclature, preparation of drawings and bills of materials, blueprint reading, and the preparation and use of concrete. Also included are maintenance needs for the home and agricultural buildings. Lab fee $8.

**AGRI 2304. Introductory Metals and Welding. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Cold metal work, soldering, pipe fitting, tool conditioning, hardware nomenclature, arc and oxyacetylene welding. Lab fee $25.

**AGRI 2317. Introductory Agricultural Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to economics principles and concepts in agriculture today as they relate to the American economic system. Emphasis will be on management problem-solving techniques under various situations, especially those agricultural in nature,including producing, processing, distributing, and consuming farm and ranch products.

**AGRI 2330. Wildlife Conservation and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles and practices used in the conservation and management of wildlife resources. Aesthetic, ecological, and recreational uses of public and private lands. Intended for non-wildlife and non-science majors; will not count toward Wildlife Science option in the BS in Wildlife, Sustainability, and Ecosystem Sciences and is not a prerequisite for advanced WSES courses.

**AGRI 3409. Genetics. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Fundamental principles of genetics: variation, heredity, and interaction of genes, linkage, sex linkage, and mutation. Special emphasis given to breeding of farm crops and domestic animals. Laboratory includes demonstration of Mendelian ratios with field crops and Drosophila and an introduction to statistical methods as applied to agricultural research. Prerequisite: BIOL 1406 or 1407 and junior classification. Lab fee $7.

**AGRI 4350. Retail Merchandising of Agricultural Products. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
Management of a retail store with emphasis on agricultural products, including meat, produce, live plants, and processed foods. Display, care, merchandising, inventory control, customer relations, and point of sale. Laboratory involves working shifts in the College of Agricultural and Environmental Sciences retail center and associated facilities.

# Agri Services and Development

## Courses

**AGSD 1100. Transitioning to University Studies in Agriculture Services and Development. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective.

**AGSD 1110. Introduction to Agricultural Services & Development. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
An introduction to the careers, opportunities, and skills needed within the agricultural services professions. Topics will include agricultural education, agricultural extension, agricultural industries, and general agriculture.

**AGSD 2306. Introduction to Mechanical Agriculture. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Introduction to current and emerging topics and industry related to agricultural mechanization and the use of mechanical principals in agricultural settings. Includes safe facility practices, construction practices, electrical energy, precision agriculture, nanotechnology, theory of the fusion of metals, efficiency of internal combustion engines, and other mechanical technology-related subjects.

**AGSD 2307. SAE Development in Agricultural Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will foster information assimilation, critical thinking and problem solving skills necessary to successfully manage a supervised agricultural experience (SAE) or any business that uses generally accepted accounting principles and business management knowledge and skills. Information, concepts and skills applied in this course will provide a foundational knowledge to be used in the implementation of recordkeeping practices in a supervised agricultural experience (SAE).

**AGSD 2311. Applied Agricultural Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Collection and computer analysis of data and records related to production agricultural enterprises. Problem-solving techniques related to the areas of animal science, agronomy, agricultural business, and agricultural mechanization are stressed.

**AGSD 2330. History and Philosophy of the Cooperative Extension Service. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the Cooperative Extension Service, the philosophy of Cooperative Extension, and Extension's role within the Land-Grant system. History, organization, program areas, and guiding principles of Cooperative Extension are discussed in detail.

**AGSD 3101. Analysis of Agricultural Occupations. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A course to advance student understanding of professional occupations in agriculture and the professional and technical competencies required.

**AGSD 3302. Agricultural Sales and Services. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Application of successful selling. Principles and practices in providing farm and ranch operations with agricultural materials, supplies, equipment, and services. Seller aspects involved in the marketing of farm and ranch products by farm-related agribusinesses. Career opportunities and preparation in agricultural sales and services will be explored.

**AGSD 3306. Lab Techniques in Agricultural Mechanics. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
The development of mechanical laboratory skills used in the teaching of agriculture with emphasis on electrical, construction, and environmental topics. Laboratory management and maintenance for effective teaching will also be emphasized. Lab Fee $12.

**AGSD 3307. Premier Leadership in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Study and application of leadership skills related to agricultural education in middle/secondary agricultural education programs.

**AGSD 3318. Land Surveying and Soil/Water Conservation Practices. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Surveying principles including leveling, total station, laser levels, and mapping as applied to agriculture. The utilization of GPS in the agricultural industry. Planning and development of structures for surface water and waste water management. Lab fee $10.

**AGSD 3325. Agricultural Electrical Systems. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Elements of: electric current generation and transmission, agricultural applications of electric heating, lighting and power, wiring, motors, and power rates. Also includes National Electrical Code and maintenance of air conditioning and cooling systems. Lab fee $16.

**AGSD 3329. Farm Utilities. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Farm water supply, sewage disposal, heating and ventilating system, farm refrigeration and farmstead layouts. Lab fee $6.

**AGSD 3330. 4-H and Youth Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of 4-H and Youth Development programs within the Cooperative Extension Service. Volunteer management and guiding principles of the 4-H and Youth Development program will be discussed. Information, concepts and skills applied in this course will provide a foundational knowledge to be used in the implementation of developing and/or managing a 4-H and Youth Development program within the Cooperative Extension System.

**AGSD 3340. Agricultural Field Machinery. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Principles of construction, operation, adjustment, calibration, and repair of agricultural tillage, planting, cultivating, spraying, fertilizing, and harvesting machinery. Laboratory activities include set-up of new equipment, wear analysis and repair of used equipment, calibration of equipment, and field operations. Lab fee $12.

**AGSD 3380. Formulation of Agriculture & Food Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the past and present development of agriculture and food policy at the state and national levels. Topics include a history of the legislative process, current agricultural issues, and the place of agriculture in the American political system.

**AGSD 4086. Problems in Agricultural Services. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Independent study in an area of specialization. May be repeated for a maximum of 6 hours credit when topics differ. Prerequisite: Approval of department head.

**AGSD 4185. Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A review of current problems and developments in agricultural services; professional opportunities and responsibilities; individual investigations and reports. Prerequisite: Senior classification.

**AGSD 4302. Processing and Storage of Agricultural Products. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The mechanical processes used in the processing and storage of grains, forages, nuts, and other agricultural products along with factors important to maintaining product quality during storage and processing. Lab fee $6.

**AGSD 4305. Agricultural Mechanical Services. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Applications of advanced phases in agricultural mechanics. The course will emphasize the organization, management, service, and use of equipment in all areas of agricultural mechanics. Prerequisite: Senior classification Lab fee: $2.

**AGSD 4306. Agricultural Mechanical Services and Instruction. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Field-based applications of agricultural mechanics instruction. This course will emphasize the organization, management, service, and use of equipment in all areas of agricultural mechanics instruction. Prerequisite: AGRI 2301 OR AGRI 2304 Lab fee: $2.

**AGSD 4307. Program Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of curriculum and programmatic management for all aspects of the secondary/middle school agricultural science and technology program. Topics include pre-employment laboratories, work-based learning, advisory committees, supervised agricultural experience programs, new program development/ implementation, foundations of agricultural education, program activism, and incorporating Agricultural Science and Technology into the total school curriculum.

**AGSD 4310. Leadership Development. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Field-based experiences designed to develop leadership ability for teaching, entrepreneurship, and conducting adult and youth organizations. Includes systems of record keeping. Lab fee: $2.

**AGSD 4320. Agriscience Course Building. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Field-based experiences are provided in a school setting where students will prepare and deliver units of instruction for middle school and secondary programs; develop unit and daily lesson plans, reports; manage curriculum issues; examine various models of instruction; implement brain-based teaching and learning techniques, analyze classroom management strategies, and demonstrate competencies in effective teaching practices. Prerequisite: EDUC 3321, EDUC 4331, EDSP 4361 and READ 3351 Lab fee $2.

**AGSD 4330. Agricultural Extension and Industry Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Agricultural extension in agriculture and the agriculture industry. Objectives include organization, methods, and program building. Prerequisite: Approval of department head.

**AGSD 4350. Animal Related Systems. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Specialized feeding, training, and fitting livestock for sales and advertising. Specialized topics in identifying, selecting, and evaluating poultry and poultry products, horses, and dairy and dairy products. Prerequisites: Senior classification and AGRI 1419 Lab fee $10.

**AGSD 4355. Mexican Agricultural Relations. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
A study of international agricultural technology, educational methodology, and diverse cultural activities related to Mexico. A required one-week trip at student's expense to Mexico will be one of the requirements necessary to meet the course objectives. Prerequisites: Junior or senior classification and approval of the instructor.

**AGSD 4383. Internship in Classroom Teaching in Agricultural Services and Development. 3 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
This internship includes supervised, field-based activities in public school classrooms. Major emphasis is placed on the development of instructional strategies and professional practices designed to improve teaching performance. Students are required to conduct a reflective analysis of their teaching performance. May be repeated for credit. Prerequisite: admission to the Teacher Education Program and approval of department head. Field experience fee $50.

**AGSD 4390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Deals with selected topics in Agricultural Services and Development. May be repeated for credit when topics vary. Prerequisite: approval of department head.

**AGSD 4601. Clinical Teaching. 6 Credit Hours (Lecture: 1 Hour, Lab: 16 Hours).**
Twelve weeks or equivalent of off-campus supervised clinical teaching in an Agricultural Science and Technology Program in selected public schools in Texas. Prerequisite: Senior classification.

**AGSD 4684. Internship. 6 Credit Hours (Lecture: 0 Hours, Lab: 12-16 Hours).**
The student will complete an approved supervised work experience with an agricultural service organization or related industry. Prerequisites: Senior classification and advisor approval. Lab fee: $2.

# Animal Science

## Courses

**ANSC 1100. Transitioning to University Studies in Animal Sciences. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective.

**ANSC 1105. Introduction to Veterinary/Medical Terminology. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course is an entry level introduction to veterinary/medical terminology. The foundation of veterinary terminologies and medical language roots, prefixes, suffixes, and combining forms are covered along with musculo-skeletal and dissection/spatial body positions. Course is offered entirely online.

**ANSC 1202. Barbeque Science. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
An introduction to the science of meat preparation, incorporating food quality and safety, ingredients and flavors, cooking techniques, cut selection and consumer preferences. Lab fee: $2.

**ANSC 1309. Introduction to Horse Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An introduction to some of the fundamental aspects of horse production, including health, genetics and disease, nutrition, reproduction, and exercise physiology.

**ANSC 1310. Introduction to Horse Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An introduction to fundamental aspects of horse management, including the status of the equine industry. Other topics include functional anatomy, locomotion, identification, equine behavior in relation to modification to training, health care management and stable management. Lab fee: $2.

**ANSC 1320. Rodeo Production and Skills. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A study of rodeo activities including organization, promotion, and management of rodeos. Skill development in all standard events will be emphasized with special attention to student needs. Lab fee $10.

**ANSC 2101. Animal Science Industry. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A review of the opportunities available to Animal Science students upon graduation, and the appropriate concentrations to achieve career goals. Prerequisites: Must be an ANSC major and must have completed AGRI 1419 or equivalent.

**ANSC 2303. Basic Horsemanship. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Instruction and practice of basic horsemanship skills. Focus will be on the proper use of feet, seat, hands and legs to provide the horse with the correct stimulus to perform basic maneuvers. Criteria from the North American Riding for the Handicapped Association Instructor Certification Exam will be presented. Prerequisite: ANSC 1309. Lab fee $5.

**ANSC 2305. Horse Handling Techniques. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Skills development in basic horse handling and application of general principles of equine psychology and behavior. Students will be assigned a young horse to halter train for fundamental groundwork. Prerequisite: instructor approval Lab fee: $2.

**ANSC 2307. Meat Animal Evaluation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Evaluation of market animals including beef cattle, swine, sheep and goats. Emphasis is on selection of breeding animals and evaluation of market animals and economically important characteristics for each species. Prerequisite: AGRI 1419.

**ANSC 2308. Meat and Carcass Evaluation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Evaluation of meat cuts and carcasses from cattle, swine, sheep and goats. Emphasis is on factors affecting quality and yield for each species. Techniques for evaluation and for preparation of written reasons. This course is required for participation in the meat judging program, but is open to all students meeting the prerequisites. Prerequisite: AGRI 1419.

**ANSC 2310. Introduction to Veterinary Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to veterinary science including structure and function of major body systems, nutrition, diseases, and surgical principles. Both farm animals and companion animals will be discussed. Prerequisite: AGRI 1319.

**ANSC 2315. Principles of Farrier Science. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
Application of the scientific fundamentals of hoof care. Topics include locomotion analysis, biomechanics, hoof trimming and horseshoeing. This course is not intended to turn out professional horseshoers. It is intended to provide information to the student so that they can understand what can and can't be accomplished by a competent farrier. Prerequisite: Permission of instructor.

**ANSC 2350. Anatomy and Physiology of Domestic Animals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to comparative anatomy and physiology of domestic animals. The roles of the various systems of the animal body will be studied with practical applications made to animal production. Topics include anatomy and physiology of the skeletal, muscular, cardiovascular, pulmonary, digestive and reproductive systems. Prerequisites: AGRI 1419 with a C or better and sophomore classification.

**ANSC 3301. Livestock Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Application of animal handling and management techniques for livestock. A study of the principles of breeding, feeding, disease and parasite control for beef, sheep, goats and swine. Prerequisites: AGRI 1419. Lab fee: $2.

**ANSC 3303. Pastures and Forages. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Identification, management, and utilization of forage crops as they pertain to the production of livestock and related species, including pastures, hay, and silage.

**ANSC 3305. Equine Evaluation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A Study of the influence of heredity, conformation, training and environmental effects on performance. A detailed evaluation of the athletic performance and conformation as it relates to function, and the criteria used for evaluation and selection of breeding, race and performance animals. Prerequisite: ANSC 1310.

**ANSC 3307. Livestock and Meat Evaluation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Comparative evaluation of breeding and market animals with emphasis on live animal selection, official carcass grading, carcass contest, wholesale cut selection and pricing, and performance testing. Oral reasons and written justifications on placing classes will be emphasized. Prerequisite: AGRI 1325 or approval of department head and instructor. Lab fee $2.

**ANSC 3308. Principles of Animal Nutrition. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An evaluation of the anatomical, physiological, and biochemical processes of digestion, absorption, and metabolism; overview of nutrients (water, carbohydrates, lipids, proteins, minerals, and vitamins) and their use within the body of animals. Prerequisites: BIOL 1406 or 1407; and CHEM 1407, 1411 or 1412.

**ANSC 3309. Applied Animal Nutrition and Feeding. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Application of nutritional concepts; understanding of nutrient requirements and development of appropriate rations for livestock. Prerequisite: ANSC 3308.

**ANSC 3315. Animal Diseases and Parasites. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Diseases of farm animals, both infectious and non-infectious, parasites, parasitic diseases. Disease and parasite prevention through sanitation, treatment of animal diseases. CREDIT FOR ANSC 3315 & VETE 3315 WILL NOT BE AWARDED. Prerequisite: Junior classification or approval of Department head. Lab fee $2.

**ANSC 3319. Animal Breeding. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specialized study of the application of genetic principles to livestock breeding. Improvement of the economic traits of farm animals by utilizing the principles of heritability and selection. Breeding and selection systems in cattle, swine, sheep, and horse production. Prerequisites: AGRI 3409, or BIOL 3303 and BIOL 3103, or BIOL 3403, or equivalent.

**ANSC 3320. Livestock Event Production. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Planning and implementing livestock events. Publicity, promotion, budgeting, scheduling, soliciting sponsors, and event production.

**ANSC 3323. Ethical Issues in Agriculture and the Natural Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will examine the several major ethical issues facing agriculture and natural resources sciences in our current society. Readings, discussions and lectures will focus on the scientific, capitalistic, and philosophical motivation in common ethical issues. Upon completion of the course, students will be able to construct and dissect ethical arguments and hopefully become more aware of the ethical dilemmas we all face each day.

**ANSC 3325. Equine Exercise Physiology and Conditioning. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Studies of the influence of training and conditioning on muscle physiology, cardiovascular physiology, the biomechanics of locomotion, and energy utilization. This course is designed for students primarily interested in training and recreational riding. Students will receive training and experience in evaluating and monitoring the levels of conditioning in horses. Fundamental rehabilitation and treatment of sports injuries will be included. Prerequisite: Junior classification; ANSC 2350/ ANSC 4305 with a C or higher, or BIOL 2401 with a C or higher Lab fee: $2.

**ANSC 3326. Horse Psychology and Training. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Hands-on application of psychology to training the horse. Lectures will use equine behavior and understanding of behavior to produce a willing, useful horse. This course is intended for students who are interested in understanding the fundamentals of equine behavior and the application to training. Students must have prior knowledge and an advance level of skill in riding and pass a riding evaluation prior to enrollment. Prerequisites: junior classification and instructor approval Lab fee: $2.

**ANSC 3330. Basic Equine and Assisted Therapy. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
Study and application of the methods of using the horse in a therapy program. Guidelines from the North American Riding for the Handicapped Association. Students will gain practical experience in the development and conduct of an equine-assisted therapy program. Prerequisite: Approval by instructor or Department Head.

**ANSC 3331. Advanced Equine Assisted Therapy. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Advanced studies in the use of the horse in a therapeutic riding program. Students will gain the hands-on experience and the information about riding, instruction and safety necessary to become a Certified Therapeutic Riding Instructor with the North American Riding for the Handicapped Association. Prerequisites: ANSC 1309, 3330, and approval of the instructor.

**ANSC 3335. Equine Behavior Modification. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Application of the principles of equine psychology to train young horses. Prerequisites: junior classification, ANSC 3323 and permission of instructor Lab fee: $2.

**ANSC 3350. Stockhorse Techniques. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Skills development in horsemanship and techniques related to western stockhorse events. Introduction to a variety of western stockhorse disciplines and rules and regulations specific to competitions. Prerequisites: ANSC 1309; instructor approval Lab fee: $2.

**ANSC 3360. Dairy Farm Evaluation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
On-site dairy farm inspections, evaluating management systems, and developing recommendations to enhance farm performance. Topics include dairy economics, management, and records. Prerequisite: AGRI 1311.

**ANSC 3399. Cooperative Education. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 3-9 Hours).**
This course is designed to offer students the opportunity to integrate academic study with work experience that is germane to their major or minor. Enrollment requires a two-semester minimum commitment that may be accomplished by 1) alternating semesters of full-time study with semesters of curriculum-related employment, or 2) enrolling in courses at least half-time (6 semester hours) and working part-time in parallel positions of curriculum-related employment. The department Cooperative Education advisor will supervise the student's experience and assign the final grade based on the student's final report which is required to complete the course. Students may participate in the Cooperative Education program for an unlimited number of semesters but a maximum of 6 hours credit may be counted toward a degree. Prerequisites: Completion of 30 semester hours which includes 12 hours in the major or minor discipline in which the Cooperative Education course is desired, minimum overall GPA of 2.5 and a minimum GPA of 3.0 in the appropriate major or minor field, and department head approval. Field experience fee $50.

**ANSC 3408. Physiology of Reproduction. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Breeding efficiency of cattle, sheep, swine, and horses. Study includes the anatomy and physiology of the male and female reproductive tracts, hormones directly controlling reproduction, estrus and estrous cycles, ovulation, mating, gestation, pregnancy tests, parturition, sperm physiology, semen evaluation, collection and storage of semen, and the primary causes of sterility in males and females. CREDIT FOR BOTH ANSC 3408 & VETE 3408 WILL NOT BE AWARDED. Prerequisites: AGRI 1419 and junior classification. Lab fee $2.

**ANSC 3409. Feeds and Feeding. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Study of principal feeds and feed-stuffs from a practical point of view. Feeding standards and calculation of rations for maintenance, growth, fattening, and for milk, wool, and egg production. Prerequisite: Junior classification and AGRI 1419 with a C or better. Lab fee $2.

**ANSC 3410. Principles of Equine Reproduction. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Theory and practices associated with equine reproduction, including mare and stallion anatomy, endocrinology, folliculogenesis, breeding soundness exams, record keeping, and health care. Prerequisite: ANSC 1309 or equivalent.

**ANSC 3421. Meat Science. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Basic physical and chemical components of meat and their influence on specific attributes of meat and meat products. Scientific and technical procedures involved in processing food animals, and anatomy, nomenclature, and evaluation of meats. Food safety issues in the meat industry and Hazard Analysis Critical Control Points. Prerequisites: AGRI 1419 and junior classification, or approval of instructor.

**ANSC 3424. Equine Nutrition. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The course will include a detailed examination of the unique anatomy and physiology of the digestive system of the horse. Dietary requirements of the six classes of nutrients will be covered in detail as well as the major sources, needs, functions, and physiological aspects of inadequate and excess intake of nutrients. Common feedstuffs and their use in formulating equine rations will be covered and ration evaluation will be introduced. Feeding programs and practical feeding management of several different classes of horses will be presented. Prerequisites: ANSC 1309 OR AGRI 1419 or AGRI 1319 with a C or higher and junior classification Lab fee: $2.

**ANSC 4084. Internship. 3,6 Credit Hours (Lecture: 0 Hours, Lab: 48 Hours).**
Formally arranged and approved on-the-job training with cooperating sponsor in a commercial or private sector of the livestock or meats industries. A minimum of 120 hours of training is required for completion. Actual required hours will be determined by the nature of the internship and the internship coordinator. Oral and written reports of internship experience are required. This course may be offered pass/fail. Prerequisite: Approval of department head.

**ANSC 4086. Animal Science Problems. 1-4 Credit Hours (Lecture: 0 Hours, Lab: 1-4 Hours).**
Individualized study of current topics in student's major concentration of study or supporting discipline. Specific content and credit dependent upon student's interest, needs, and depth of study. May be repeated for a maximum of 6 semester hours credit. Prerequisite: Senior classification and advance approval by academic advisor.

**ANSC 4185. Senior Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A review of current problems and developments in agriculture; professional opportunities and responsibilities; individual investigations and reports. Prerequisite: Senior classification.

**ANSC 4300. Research and Writing in Animal Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Detailed discussions and literature review of current knowledge in areas such as reproductive and alimentary physiology, nutrition, parasitology, pharmacology, and genetics. Topics will include experimental design and statistical evaluation of agricultural research. Students will prepare various types of writings based on scientific literature. Prerequisite: senior classification in agriculture.

**ANSC 4302. Dairy Cattle Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Principles of dairy science and their application to the feeding and management of dairy cattle. Topics include herd improvement, selection, feeding, replacement stock development, disease control, animal welfare, milk marketing, and associated management practices. Prerequisite: AGRI 1419 or AGRI 1311; ANSC 3408; ANSC 3409 or ANSC 4306 or ANSC 3309; or permission of instructor.

**ANSC 4303. Beef Cattle Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An overview of the beef cattle industry, with emphasis on the seedstock and cow-calf sectors. Prerequisites: ANSC 3408 and either ANSC 3409 or 4306.

**ANSC 4308. Environmental Physiology of Farm Animals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies of farm animals and interactions with their physical environment. Detailed attention is given to the effects of changes and extremes in natural and artificial animal environments, including temperatures, shelter, altitude, humidity, crowding, and other stress factors associated with modern livestock production and handling practices. Prerequisites: AGRI 1419 or AGRI 1319 with a C or better, and ANSC 2350 or approval of instructor.

**ANSC 4310. Swine Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Applications of nutrition, genetics, breeding, and reproduction to swine production. All aspects of production, with a focus on production systems. Prerequisites: ANSC 3408, ANSC 3409, and ANSC 3319; or permission of Department Head.

**ANSC 4312. Meat Processing and Merchandising. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The chemical and physical characteristics of meats and their relations to the processing and manufacturing of meat food items. Carcass value as influenced by merchandising techniques and practices. Sanitation control and commercial and retail operations will be stressed. Laboratory work will include meat processing and the development of competencies in processing all classes of livestock. Prerequisite: ANSC 3421 or approval of department head. Lab fee $10.

**ANSC 4313. Sheep and Goat Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Practical applications of breeding, feeding, management, disease and parasite control with regard to range and farm conditions; fitting and showing. Wool and mohair production; grading; sorting; and marketing. Prerequisites: AGRI 1419, and ANSC 3408; ANSC 3409 or ANSC 4306 or ANSC 3309.

**ANSC 4314. Food Quality Assurance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The basis behind food quality control/assurance is discussed along with its application to various food systems to control and improve the quality and safety of our food supply. Credit will not be awarded for ANSC 4341 and ANSC 5314. Lab fee: $2.

**ANSC 4319. Biotechnology in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of modern biotechnology in agriculture today. This course will explore important advancements and tools in fields such as genetics, agronomy, and bioinformatics. It will also examine the legal constraints and ethical debates that surround these technologies. Credit will not be awarded for both ANSC 4319 and ANSC 5319. Prerequisites: AGRI 3409, or BIOL 3303 and 3103, or instructor approval.

**ANSC 4320. Stocker Cattle Production and Feedlot Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An in-depth examination of nutrition, marketing, consumer relations, and management of beef cattle stocker and feedlot operations. Credit will not be given for both ANSC 4320 and ANSC 5320. Prerequisites: ANSC 3408 and either ANSC 3409 or ANSC 4306.

**ANSC 4330. Horse Enterprise Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Individualized instruction in management techniques for horse enterprises. Record systems, marketing, and business operation procedures. Prerequisites: Senior classification in ANSC, ANSC 1309 and approval of instructor.

**ANSC 4338. Value-Added Processed Meats. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The application of scientific principles and practices to further processed meat products. Interrelationships among tissue characteristics, ingredients, handling practices, processing technologies and storage conditions as they affect the quality, safety, and stability of muscle foods. Prerequisite: ANSC 3421 Lab fee: $2.

**ANSC 4350. Feed Analysis. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Analytical techniques for determining the nutrient content of animal feeds. Students will learn to measure moisture, protein, fiber, carbohydrates, fats, and minerals. Different methods for estimating the useable energy content of feeds will be presented. Prerequisite: CHEM 1412 or approval of department head.

**ANSC 4351. Environmental Stewardship in Animal Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Techniques and practices in animal production for good stewardship of land, water, and air. Review of applicable state and federal environmental laws. Prerequisite: AGRI 1419 or AGRI 1311 with a grade of "C" or better; CHEM 1411 or CHEM 1407; BIOL 1406 or BIOL 1407.

**ANSC 4358. Laboratory Topics in Animal and Food Science. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Individualized instruction in laboratory analytical procedures, techniques, and instrumentation commonly used in animal and food sciences. Topics involve various aspects of analysis techniques associated with nutrition, reproduction, breeding, physiology, and meats and dairy-products processing. May be repeated once when topics vary. Lab fee $20. Students may also need to purchase appropriate personal articles such as protective apparel.

**ANSC 4361. Animal Science Study Tour. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
Field course in animal agriculture designed to acquaint students with live animal operations, related businesses, and food/feed facilities. Includes travel to various sites. Prerequisite: Instructor approval.

**ANSC 4390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics in the animal sciences. May be repeated for credit when topics vary, with a maximum of six hours. Prerequisite: approval of department head.

**ANSC 4401. Ethology. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
An introductory course in the behavior of animals, with emphasis on the natural selection, ontogeny, and function of behaviors as they relate to feeding, reproduction, predator-avoidance, and other traits. Both proximate (sensory, hormonal, genetic) and ultimate (ecological and evolutionary) mechanisms are addressed. Prerequisite: C or better in BIOL 1406 and BIOL 1407, and a C or better in either AGRI 1419 or WSES 2322. Lab fee: $2.

**ANSC 4440. Sustainable Livestock Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Overview of beef, dairy, swine, small ruminant and poultry production systems and their applications. Modern concepts, ideas, and methodology associated with the application of technology to reproduction, breeding, health, nutrition and nutrient utilization, across various management schemes. Prerequisite: ANSC 3319, ANSC 3408, and either ANSC 3409 or ANSC 4306.

**ANSC 5048. Animal Science Applied Project. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Design, implement, and complete an independent project; integrate the knowledge and skills learned in the program; advance the application of scientific principles. Written report and oral communication of the results.

**ANSC 5085. Animal Science Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Graduate seminar with content varying according to student and curricular needs. May be repeated for a total of three credit hours. Prerequisite: Graduate classification.

**ANSC 5086. Animal Science Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Advanced studies in animal science problems and procedures. Problems assigned according to experience, interest, and needs of individual student.

**ANSC 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to complete the thesis. No credit until the thesis is completed. Prerequisite: Approved research methodology course and approval of the instructor of record.

**ANSC 5090. Special Topics in Animal Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Selected topics in Animal Sciences offered as needed and dependant upon departmental, faculty, and student interests. May be repeated as topics vary. Instructor approval required prior to registration.

**ANSC 5185. Animal Science Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Graduate seminar with content varying according to student and curricular needs. May be repeated for a total of three credit hours. Prerequisite: Graduate classification.

**ANSC 5301. Experimental Design in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Common and anomalous designs encountered in conduct of research in the agricultural and environmental sciences. Proper analysis of these designs and common pitfalls in experimental design. Students are expected to enter with a cursory knowledge of introductory statistics.

**ANSC 5302. Forage Biology and Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Biology of forage growth, metabolic pathways of the plant, and physiological response to stressors that contribute to pasture management.

**ANSC 5303. Rumen Microbiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Scientific and practical evaluation of the rumen microbiome, with emphasis on functional classes and substrate preferences, and its impact on animal nutrition and performance.

**ANSC 5304. Ruminant Nutrition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Survey of current knowledge and concepts in ruminant physiology and biochemistry, their literature and experimental basis and relation to current and future practice and investigation. Prerequisites: ANSC 4306 and graduate classification.

**ANSC 5305. Advanced Livestock Production. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Survey of current knowledge and concepts in breeding and reproduction, nutrition, and modern management of livestock. Review of past and present research and application to future practice. Prerequisites: ANSC 3408 and graduate classification.

**ANSC 5306. Assisted Breeding Technology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theory and practice of assisted breeding technology in modern breeding programs for farm livestock and other animal species.

**ANSC 5307. Advanced Beef Cattle Production. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Current technologies and management practices for beef cattle. In-depth study of current knowledge, available technologies, implementation methods, and expected benefits for the beef cattle industry. Prior knowledge or experience in beef cattle production recommended.

**ANSC 5308. Measuring Animal Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced course in the principles and methods of quantitative studies of behavior, with an emphasis on techniques of observation, recording, and analysis.

**ANSC 5309. Assessing the Welfare of Livestock and Poultry. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Basic components of animal welfare assessments, review of current industry assessment tools and animal welfare audits. Prerequisite: Graduate status.

**ANSC 5313. Advanced Meat Goat Production and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In-depth study and applications of management situations for breeding, feeding,housing, and herd health of goats. Prerequisites: AGRI 1319 or equivalent and approval of instructor.

**ANSC 5314. Food Quality Assurance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The basis behind food quality control/assurance is discussed along with its application to various food systems to control and improve the quality and safety of our food supply. Credit will not be awarded for ANSC 4341 and ANSC 5314. Lab fee: $2.

**ANSC 5315. Animal Growth and Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the processes related to animal growth. Emphasis on cellular changes allowing for muscle, bone and adipose tissue growth as well as the role and functions of hormones related to development and age-related adaptation. Composition of muscle, bone, and adipose tissue in market animals will be discussed. Prerequisites: AGRI 1319 and approval of instructor.

**ANSC 5316. Grant Writing and Funding Aquisition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course in terminology and processes associated with grant writing and the acquisitions of research funds.

**ANSC 5318. Ethical/Environmental Issues in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Ethical and environmental issues affecting public policy as related to agrieducation/industry/business. Credit for both ANSC 5218 and AGCR 5318 will not be awarded. Prerequisites: Approval of instructor.

**ANSC 5319. Biotechnology in Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of modern biotechnology in agriculture today. This course will explore important advancements and tools in fields such as genetics, agronomy, and bioinformatics. It will also examine the legal constraints and ethical debates that surround these technologies. Credit will not be awarded for both ANSC 4319 and ANSC 5319.

**ANSC 5320. Stocker Cattle Production and Feedlot Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An in-depth examination of nutrition, marketing, consumer relations, and management of beef cattle stocker and feedlot operations. Credit will not be given for both ANSC 5320 and ANSC 4320.

**ANSC 5338. Value-Added Processed Meats. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The application of scientific principles and practices to further processed meat products. Interrelationships among tissue characteristics, ingredients, handling practices, processing technologies and storage conditions as they affect the quality, safety, and stability of muscle foods.

**ANSC 5340. Advanced Dairy Ration Balancing and Records Management. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Students will learn to evaluate real-life dairy rations and feeding management strategies and make suggestions for improvements. Students also will learn to evaluate dairy herd management records and make management recommendations based on those records. The course is for students who desire advanced practical training in applied nutrition and dairy herd management. Prerequisite:AGRI 3302 or equivalent.

**ANSC 5350. Laboratory Methods in Animal Research. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Skill development in laboratory techniques and analysis related to animal science research. Application of live animal data collection. Introduction to institutional animal care and use protocols and ethical use of animals in research. Prerequisites: Graduate standing; instructor approval. Lab fee: $2.

**ANSC 5355. Animal Metabolism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course is structured to provide an overview of various regulatory mechanisms of metabolism and changes due to exercise, stress, pregnancy, nutrient imbalance, disease and toxic effects. Prerequisites: Graduate standing; 3 hours of animal or human nutrition AND 3 hours of anatomy and physiology OR department head approval.

**ANSC 5356. Non-Ruminant Nutrition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced course in nutritional science focusing in advanced topics in intergrated nutrient metabolism; advanced digestive physiology, nutritional requirements and nutritional imbalances and subsequent disease states in non-ruminant animals. Prior coursework in metabolism or biochemistry is recommended.

**ANSC 5360. Lactation Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is structured to provide a systematic overview of lactation physiology using dairy cattle as the main model.

**ANSC 5380. Research and Writing for Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Preparation of writing samples, technical reviews, and/or professional manuscripts related to various topics in agriculture. Prerequisites: Approved research methodology course and approval of instructor of record.

**ANSC 5399. Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 8 Hours).**
Prepared and supervised work experience in an Animal Science-related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of the student's graduate committee. Field experience fee $50.

# Anthropology

## Courses

**ANTH 2302. Introduction to Archeology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of human prehistory and the origins of civilization. Topics covered include archeological theory and methodology, the evolution of humans, the origins of culture, development of agriculture, and the early history of world civilizations. Theory reinforced by field experience.

**ANTH 2351. Cultural Anthropology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A comparative study of culture, cultural patterns, and sociocultural change with the emphasis on preliterate societies.

# Art

## Courses

**ARTS 1100. Transitioning to University Studies in Art and Digital Media. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of art and digital media disciplines.

**ARTS 1301. Art Appreciation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A theory course designed to introduce the trends, techniques, styles, and major personalities of the visual arts.

**ARTS 1303. Art History I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A chronological examination of Western painting, sculpture, architecture and related visual arts from prehistoric times to the end of the Gothic Period.

**ARTS 1304. Art History II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A chronological examination of painting, sculpture, architecture and related visual arts from the early Renaissance to the present.

**ARTS 1311. Design I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Emphasis on two-dimensional design; includes the fundamentals of line, color, form, texture, shape, space, and arrangement. Medias such as drawing, painting, and digital design will be introduced.

**ARTS 1312. Design II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Continuation of Design I with emphasis on three-dimension concepts. Tools for construction of 3D objects will be covered including digital fabrication, manual and electronic equipment, and 3D display techniques. Lab fee: $2.

**ARTS 1316. Drawing I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A beginning course investigating a variety of media, techniques, and subjects, exploring perceptual and descriptive possibilities and consideration of drawing as a development process as well as an end in itself.

**ARTS 1317. Drawing II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Expansion of Drawing I stressing expressive and conceptual drawing aspects, including the human figure within a spatial environment. Prerequisite: ARTS 1316.

**ARTS 2316. Painting I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An introduction to painting media with an emphasis on color, composition, and self expression. Prerequisites: ARTS 1311, 1316, 1317, or approval of department head. Lab fee $2.

**ARTS 2326. Sculpture I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Sculpture is a introductory course designed to develop skills in building three-dimensional form by learning to work with a variety of tools and techniques. Special emphasis will be put on artistic and conceptual development. Prerequisite: ARTS 1312 or instructor permission.

**ARTS 2344. Game Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This introductory course, which explores both digital and non-digital games, aims to provide a critical vocabulary and historical context for analyzing games as an art form and mode of expression. Students will be encouraged to create meaningful play and interactive experiences in various forms of media. Lab fee: $10.

**ARTS 2348. Digital Art I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Introduction to the concepts and techniques utilized in the creation of digital media design and art, including digital imaging, vector graphics, animation, and page layout for print and web. Lab fee $2.

**ARTS 2349. 3D Modeling. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course introduces the basic 3D modeling tools and techniques within a 3D Application. Students will use 3D application to create 3D models, create simple animation, basic lighting/rendering, texturing and using the three basic modeling toolsets; NURBS, Polygons and Subdivision Surfaces. Lab fee: $10.

**ARTS 2356. Photography I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course covers basic to intermediate digital camera operation, production, software, and professional display techniques. The course will focus on developing technical proficiency, aesthetic skills, and will examine the medium's history and use in contemporary society. Lab fee $10.

**ARTS 3310. Introduction to Art Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to assist the preparing classroom teacher in developing a basic knowledge of art and art teaching at the grade school level so they can integrate meaningful visual art experiences into effective lesson plans and curriculum development. Prerequisite: Design 1 ARTS 1311.

**ARTS 3311. Experimental Media Studio. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A studio course in experimentation in two- and three-dimensional media and techniques. May be taken for credit twice. Prerequisites: ARTS 1312, 1317 or department head approval. Lab fee $5.

**ARTS 3321. Life Drawing. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An advanced drawing course based on the observation of the human figure and interpretation through a variety of drawing techniques. May be taken for credit twice. Prerequisite:ARTS 1316 Lab fee $2.

**ARTS 3331. Art History of America. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the art of America from pre-Columbian periods to the present.

**ARTS 3332. Contemporary Movements in Art. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will survey the Visual Arts since the Second World War, primarily in the United States and Europe, but with some consideration of developments in the larger international arena.

**ARTS 3333. Art History of the Non-Western World. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to introduce students to works of art in various media developed outside of the European tradition.

**ARTS 3341. Painting II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A continued investigation of the technical qualities and expressive possibilities of painting media with emphasis on personal and stylistic development. Prerequisite: ARTS 2316 or approval of department head. Lab fee $2.

**ARTS 3351. Sculpture II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An advanced investigation of the cultural techniques, methods and media of Sculpture.Prerequisites: ARTS 1312, 1316 or approval of department head. Lab fee $2.

**ARTS 3360. Graphic Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course is designed to provide a survey of the role of the computer in contemporary graphic design. Students will receive basic training on the primary types of software and peripherals with which digital artists and designers must be familiar. Typography practice will be heavily emphasized. Prerequisite: ARTS 2348 or instructor permission.

**ARTS 3361. Photography II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An intermediate level studio art course intended for students wishing to further their creative abilities using contemporary photographic techniques. Students will be further their technical skills and artistic vision through hands-on practice, lectures and demonstrations. Prerequisites: ARTS 2348 or instructor approval. Lab fee: $2.

**ARTS 3362. Digital Illustration I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Digital Illustration is a studio course that explores digital illustration as a form of creative expression. Students will learn to capture work from traditional media and combine it with techniques such as digital painting and vector graphics. Students will be introduced to some of the many commercial and artistic paths of illustration: editorial, sequential art, concept art, character development, and others. The relationship of illustration with other fields, such as animation, graphic design, and traditional media will be explored. Prerequisites: ARTS 2348 or instructor approval. Lab fee: $10.

**ARTS 3363. Tradigital Animation I. 3 Credit Hours (Lecture: 4 Hours, Lab: 2 Hours).**
This class is an intermediate study of 2D animation with digital software. Techniques may include stop motion, cut out animation, and digital based drawing animation. Short films and scenes of feature animated and live action feature film will be used to illustrate the many concepts studied in this class. Lab fee: $2.

**ARTS 3364. 3D Animation I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Introduction to the art of 3D animation. Students learn how to plot, script, storyboard, present, and create animations using the principles of animation and basic techniques, including staging, timing, mechanics and kinetics. Also, this class will introduce students to the process of technical creation of animated imagery through various media including traditional hand-drawn methods up to 3D computer applications. Prerequisite: ARTS 2348, or instructor approval. Lab fee: $2.

**ARTS 3365. Special Effects and Compositing I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This intermediate studio course explores various aspects of special effects and compositing multimedia. Students will learn how to composite robust and immersive experiences by combining the elements of graphics, special effects and visual effects, animation, video, and audio to make effective multimedia works. Prerequisites: ARTS 2344 or instructor approval. Lab fee: $2.

**ARTS 3366. Level Design I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This studio art course will cover 2D- and 3D-level setting design for video games and animation. Students will learn tools and concerns as well as develop the skills used to create 2D and 3D game level designs by using architectural theory, concepts of critical path and flow, balancing, lighting, game play experience, and various storytelling techniques for level design. Prerequisite: ARTS 2344 or instructor approval. Lab fee: $2.

**ARTS 3368. Narrative Film Arts I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This intermediate studio course will cover production of short films using digital video and other experimental approaches. Emphasis on video concepts, techniques, composition, sequencing of ideas, and narrative structures. Lab Fee: $2.

**ARTS 3371. Printmaking. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
The basic printmaking processes including planographic, intaglio, stencil, and relief. May be taken for credit twice. Prerequisite: ARTS 1311, 1316, or approval of department head. Lab fee $10.

**ARTS 3383. 3D Modeling. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Introduction to the basic modeling tools and techniques within 3D computer applications. Students will create 3D models, simple animations, basic lighting/rendering, texturing while using the basic modeling tool sets; NURBS, Polygons and Subdivision Surfaces. Lab fee: $10.

**ARTS 4086. Individual Problems in Art. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Art problems assigned in the area of the student's individual interest with emphasis on individual development. Prerequisite: ARTS 1317.

**ARTS 4341. Painting III. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An advanced investigation of the technical qualities and expressive possibilities of painting media with emphasis on research and presentation strategies. Lab fee: $2.

**ARTS 4351. Sculpture III. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This advanced studio course course focuses on specific topics and practices in contemporary sculptural installation works. Technical instruction may include sculptural and architectural model building, wood, metal, and plastic fabrication, lighting, sound works, video works, and cloth and alternative material fabrication methods. Lab fee: $2.

**ARTS 4361. Photography III. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Advanced studio course in photography and digital image production with an emphasis on on conceptual development and professional display and publication in a variety of media, such as print, web, and mobile devices. Emphasis on visual communication strategies and creative thinking. Prerequisites: ARTS 3361. Lab fee: $2.

**ARTS 4362. Digital Illustration II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course is an advanced studio course that explores digital illustration as a form of creative expression. Students will create a larger body of work in preparation for an artistic exhibition or a public presentation. Students will use their advanced skills in illustration to construct a professional portfolio and investigate possible artistic, commercial, and industrial opportunities. Students will be encouraged to develop a personal style in a variety of media. Prerequisites: ARTS 3362 Lab fee $10.

**ARTS 4363. Tradigital Animation II. 3 Credit Hours (Lecture: 4 Hours, Lab: 2 Hours).**
This class is an advanced study of 2 dimensional animation with digital software. Techniques may include stop motion, cut out animation, and digital based drawing animation. Students will be encouraged to develop their own projects and short films from the concept stage to completion. Prerequisite: ARTS 3363 Lab fee $2.

**ARTS 4364. 3D Animation II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Advanced studio course in animation. Students will be expected how to plan, develop, and produce animations using the principles of animation and advanced techniques. Advanced topics such as character kinematics, gait movement, lighting and textures will be covered. Prerequisites: ARTS 3364. Lab fee: $2.

**ARTS 4365. Special Effects and Compositing II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This advanced studio course explores various aspects of special effects and compositing multimedia. Students will furthur their skills in how to composite robust and immersive experiences by combining the elements of graphics, special effects and visual effects, animation, video, and audio to make an effective multimedia presentation. Prerequisites: ARTS 3365. Lab fee: $2.

**ARTS 4366. Level Design II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This advanced studio art course will cover 2D- and 3D-level setting design for video games and animation. Students will create content from commercial game engines that show advanced levels of skill and expression of content. Prerequisites: ARTS 3366. Lab fee: $10.

**ARTS 4367. 3D Rendering and Lighting. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This advanced course is designed to cover concepts involved in the digital application of texture maps for virtual 3D models, 3D material qualities and characteristics, digital lighting concepts and design, and rendering methods. The importance of digital cinematography, scene arrangement, and compositing of 3D elements of color, camera and light are goals of aesthetic integration. Prerequisite: ARTS 2344. Lab fee: $10.

**ARTS 4368. Narrative Film Arts II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This advanced studio course will cover production of short films using digital video and other experimental approaches. Emphasis on more independently directed short films. Prerequisite: ARTS 3368 or COMS 3308.

**ARTS 4370. Interaction Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This is an advanced studio art course that explores the use of programming skills in the creation of creative mobile web applications, as well as other kinds of digital environments. Technical skills that will combine the use of graphics, audio, and video along with sensible interface design will be covered. Resources will be provided for students with no programming background. Lab fee: $10.

**ARTS 4371. Advanced Studio Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A guided project-based course with emphasis on portfolio preparation for Art and Digital Media students. Lab fee: $2.

**ARTS 4372. Collaborative Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course is a product driven course for the Art and Digital Media Studies Program. Students will form teams and collaborate with another using their talents and expertise to develop a digital media project as assigned by the instructor. Emphasis will be placed on collaboration both inside the classroom, and across disciplines.

**ARTS 4380. Post Studio Practice. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Students encounter art methods that are primarily executed outside of the studio setting. Students will become aware of the importance of place and how a work can be situated in response to it. This will include object-based participatory works, installation methods in response to specific locations, ephemeral works, social engagement and interactions with audiences, and other collaborative methods. Lab fee: $2.

**ARTS 4384. Internship in Art or Digital Media. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Approved and supervised work experience in art or digital media related positions. May be repeated once for a total of 6 hours of academic credit. Prerequisite: Junior standing and 12 hours Art or approval of department head.

**ARTS 4385. Art Seminar. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Content varies according to the needs of students and opportunities available. When topic varies, course may be repeated for credit. Prerequisite: Junior classification or approval of department head.

**ARTS 4390. Art/ Digital Media Portfolio Capstone. 3 Credit Hours (Lecture: 1 Hour, Lab: 12 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An integrative course providing an overview of pertinent issues in creating a professional art portfolio. Students will produce a body of art works that are representative of their style and abilities. Written discourse on the visual arts will be stressed. Prerequisite: Senior level status. Art majors seeking education certification must take this course before the semester in which they are student teaching. Lab fee $5.

# Athletic Training

## Courses

**ATRN 5191. Clinical I. 1 Credit Hour (Lecture: 0 Hours, Lab: 9 Hours).**
Clinical I is designed to allow integration and evaluation of athletic training competencies and proficiencies in a clinical environment under the supervision of an approved preceptor. Clinical settings for hands on, supervised experience might include (but is not limited to) university, high school, clinic/outreach, hospital, industrial, or military. Prerequisite: ATRN 5351.

**ATRN 5192. Clinical II. 1 Credit Hour (Lecture: 0 Hours, Lab: 9 Hours).**
Clinical II is designed to allow integration and evaluation of athletic training competencies and proficiencies in a clinical environment under the supervision of an approved preceptor. Clinical settings for hands on, supervised experience might include (but is not limited to) university, high school, clinic/outreach, hospital, industrial, or military. Prerequisites: ATRN 5191, 5452, 5453.

**ATRN 5194. Clinical IV. 1 Credit Hour (Lecture: 0 Hours, Lab: 9 Hours).**
Clinical IV is designed to allow integration and evaluation of athletic training competencies and proficiencies in a clinical environment under the supervision of an approved preceptor. Clinical settings for hands on, supervised experience might include (but is not limited to) university, high school, clinic/outreach, hospital, industrial, or military. Prerequisites: ATRN 5293, 5458, 5359.

**ATRN 5293. Clinical III. 2 Credit Hours (Lecture: 0 Hours, Lab: 18 Hours).**
Clinical III is designed to allow integration and evaluation of athletic training competencies and proficiencies in a clinical environment under the supervision of an approved preceptor. Clinical settings for hands on, supervised experience might include (but is not limited to) university, high school, clinic/outreach, hospital, industrial, or military. This course provides students the opportunity to experience fall two-a-day workouts with an assigned setting. Prerequisites: ATRN 5357 and ATRN 5356.

**ATRN 5351. Athletic Training Techniques. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview and practice of basic athletic training techniques used for the prevention and care of injuries to the physically active patient. Prerequisite: Acceptance into the MSAT degree program.

**ATRN 5356. Evidence Based Practice & Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course addresses the role of research in the athletic training profession including conducting research, research sources utilization and dissemination, and principles of evidence based practice. This class will help you learn to take challenging clinical issues and apply a step by step process of evidence based practice in order to find solutions. Prerequisites: ATRN 5454, ATRN 5455, ATRN 5192.

**ATRN 5357. Leadership in Athletic Training. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to instruct and develop leadership skills in athletic training. Prerequisites: ATRN 5454, ATRN 5455, ATRN 5192.

**ATRN 5359. Trends in Athletic Training. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will learn about and discuss current trends and issues within the athletic training profession. Prerequisites: ATRN 5356, ATRN 5357.

**ATRN 5360. Healthcare Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Overview of administrative principles related to the operation of an athletic training program and healthcare facility. Prerequisites: ATRN 5458, ATRN 5359, ATRN 5293.

**ATRN 5361. Empowering Success. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an integrative learning experience drawing on all previous coursework in order to complete a project that is impactful in the healthcare community. Additionally, students are required to register and prepare for their BOC certification exam as part of this course. Prerequisites: ATRN 5458, ATRN 5359, and ATRN 5293.

**ATRN 5362. Study Abroad/Cultural Healthcare. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to allow a cultural healthcare experience abroad. Students may be exposed to non-Western medical techniques or assist in teaching prevention and care techniques to coaches/athletes in third-world countries. Locations and experiences will vary by year.

**ATRN 5452. Therapeutic Interventions. 4 Credit Hours (Lecture: 4 Hours, Lab: 4 Hours).**
Investigation of the scientific principles and the application of therapeutic modalities and pharmacological agents in athletic training. Includes therapeutic purposes, indications, contraindications, and adverse effects. Prerequisite: ATRN 5351.

**ATRN 5453. Orthopedic Assessment I. 4 Credit Hours (Lecture: 4 Hours, Lab: 4 Hours).**
The study and integration of orthopedic assessment techniques to distinguish lower extremity injuries common to the physically active patient. Posture and gait analysis are also applied to the assessment process. Prerequisite: ATRN 5351.

**ATRN 5454. Orthopedic Assessment II. 4 Credit Hours (Lecture: 4 Hours, Lab: 4 Hours).**
The study and integration of orthopedic assessment techniques to distinguish upper extremity and spinal injuries common to the physically active patient. Prerequisites: ATRN 5452, ATRN 5453, and ATRN 5191.

**ATRN 5455. Therapeutic Exercise. 4 Credit Hours (Lecture: 4 Hours, Lab: 4 Hours).**
The theory and application of therapeutic exercise tools and techniques in the rehabilitation of injuries to the physically active patient. Prerequisites: ATRN 5452, ATRN 5453, and ATRN 5191.

**ATRN 5458. General Medical Assessment. 4 Credit Hours (Lecture: 4 Hours, Lab: 4 Hours).**
This course provides an understanding of injury, illness and/or disease of various body systems (including cardiovascular, gastrointestinal, dermatological, neurological, etc). The course includes discussion of diagnostics and interventions, as well as participation considerations for physically active patients. Prerequisites: ATRN 5356, and ATRN 5357.

# Business Computer Information Systems

## Courses

**BCIS 1305. Business Computer Applications. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An overview of computer concepts and applications, including popular productivity software. Students will acquire skills in the use of personal computers and software applicable to the management of information and delivery of services in a wide variety of fields. Lab fee $15.

**BCIS 1315. Principles of Web Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course teaches students how to plan, design, and create professional websites using the latest industry tools. Students will gain a basic understanding of web design and will explore topics such as planning, accessibility, and operational issues surrounding web design.

**BCIS 1317. Personal Computer Maintenance and Hardware. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An enhanced study of technology and hardware operation of microcomputers, their peripherals, and operating systems. Also considered are hardware configuration and selection, installation, test procedures, and maintenance. Lab fee: $15.

**BCIS 3300. Computer Technology and Impact. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The course explores the relationship between technology and society examining past, present, and future technologies Many topics are present including hardware and software fundamentals, the relationship between technology and society, technology and values, sociotechnical systems, and future challenges of technology and society. An emphasis is placed on businesses and the place of business in society utilizing information technologies. Lab fee: $2.

**BCIS 3302. Database and Data Management for Small Businesses. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Studies relational database packages. In addition, students improve their knowledge and skill with a current personal computer operating system. Lab fee $15.

**BCIS 3305. Operating Systems Theory and Practice. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of the history, development, and principles of computer operating systems and their variants in mainframe, minicomputer, server, and microcomputer application environments. Topics will include related software issues, programming capabilities, and job control languages. Selected operating systems representing various hardware environments will be studied. Lab fee $15.

**BCIS 3315. Web Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Students will explore the underlying technical foundations of web design and programming. Emphasis will be placed on HTML and CSS coding as well as principles of client side scripting languages such as Javascript. Prerequisites: BCIS 1315 or Approval of Department Head. Lab fee: $2.

**BCIS 3332. Java Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A first course in the Java programming language. Covers the basic structure of Java, all standard features, data representation, and simple I/O. Students will analyze and program several representative programs. Lab fee $15.

**BCIS 3333. C# Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A first course in the C# programming language. Covers the basic structure of C#, all standard features, data representation, and simple I/O. Students will analyze and program several representative problems. Lab fee $2.

**BCIS 3342. Advanced Java Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An advanced course in the Java programming language. Covers advanced Java capabilities such as class features, error handling, graphical user interfaces, applets, and advanced object-oriented programming techniques. Students will analyze and program several representative problems. Prerequisite: BCIS 3332 or BCIS 3333 or approval of department head. Lab fee: $2.

**BCIS 3343. Advanced C# Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Advanced programming using the C# programming language to create Windows applications in an Internet and intra-network environment. Explores object-oriented design, client-server interaction, event-driven programming, graphical user interfaces, distributed data, and distributed applications. Prerequisite: BCIS 3332 or BCIS 3333 or approval of department head. Lab fee: $2.

**BCIS 3347. Data Communications. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of voice and data communications technologies, concepts, and applications, including communications terminology, hardware, software, protocols, and managerial issues in data and voice communications. Topics will include alternatives available in hardware, software, and transmission facilities, design integration, selection and implementation of communications solutions. In addition, students will explore the current and future impact and direction of these technologies. Lab Fee $15.

**BCIS 3348. Network Architecture Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of network architecture, industry standards and communications protocols, the placement of networking devices and components, transmission media selection, logical and physical topologies, data transmission, and structured cabling for local area networks (LANs) and wide area networks (WANs). Network designs will include required components and address services as specified in an industry specific Request for Proposal (RFP). Application exercises will include preparing and presenting a design proposal in response to an RFP and installation, configuration, testing and troubleshooting of WAN/LAN wiring interface technologies. Prerequisite: BCIS 3347 or the approval of the department head Lab fee: $2.

**BCIS 3389. System Analysis and Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the systematic analysis, design, and implementation of software systems with special emphasis on the processes and skills used in the first four stages of the System Development Life Cycle. Traditional and current methodologies, including computer aided analysis and design tools will be considered. Topics will be approached through project-oriented cases and projects, which integrate theory and practical application. Prerequisite: BCIS 3332 or BCIS 3333 or approval of department head. Lab fee: $2.

**BCIS 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a Computer Information Systems related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of department head.

**BCIS 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Selected individual topics in business on technical computer applications, practicum, field project, or other suitable computer studies. May be repeated for a maximum of 6 semester hours credit. Prerequisites: Approval of instructor and department head.

**BCIS 4090. Special Topics in Computer Information Systems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An examination of current topics in computer information systems. Readings required from current computer information systems publications and other related periodicals. May be repeated for credit when topics vary. Prerequisite: 9 hours in BCIS.

**BCIS 4301. Database Theory and Practice. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Database concepts and structures. File and data management principles underlying database construction. Fundamental types of database models, with emphasis on relational databases as well as on major non-relational forms. Practice in analysis, design, development, and optimization of working database applications on a variety of problems. Small and large system databases will be considered. Prerequisite: BCIS 3332 or BCIS 3333 or approval of department head. Lab fee $2.

**BCIS 4308. Advanced Programming Language. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Develops the programming proficiency in a modern programming language. Students complete many programming assignments to achieve necessary knowledge and skills. May be repeated as topics vary. Prerequisite Approval of instructor or department head. Prerequisite: Approval of instructor or department head Lab fee: $2.

**BCIS 4315. Interactive and Applied Multimedia. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An exploration of multimedia tools and their relationships to various disciplines of study. A review of the principles of multimedia and the effective uses of multimedia will be conducted. The production and design of multimedia systems will culminate the course of study. Lab Fee $2.

**BCIS 4320. Computer Forensics. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course will examine the principles and practice of conducting computer forensics investigations for both criminal and business application. Students will apply investigative methods to properly conduct a computer forensics investigation beginning with a discussion of ethics. Students will examine and use various technologies, software and procedures applicable to forensic investigation. The course will also cover the legal responsibilities and key evidentiary procedures necessary to conduct the computer forensics process. Students should have a working knowledge of hardware and operating systems to maximize their success on projects and exercises in this course. Prerequisite: Junior Standing or the approval of the instructor or department head.

**BCIS 4342. Ethical Hacking & Network Defense. 3 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
Introduces intrusion security testing as a method for improving network defense to computer users with a solid grounding in computer and networking basics. Students will learn how to identify network security vulnerabilities by employing the techniques and software normally used by hackers to compromise networks. Students will then learn the process of determining the best practices in how to secure those vulnerabilities. Topics will include the mission and limitations of security and penetration testers along with the legal ramifications and restrictions involved. Students will be study the various methods of hackers, operating systems threats for Windows and UNIX based systems, cryptography, and modern network protection systems. Prerequisite: Junior standing or approval of instructor or department head.

**BCIS 4343. Advanced Systems Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course concentrates on advanced systems analysis concepts with an emphasis in data and process decomposition and modeling. CASE tools support both the models and the interaction analysis of processes and data. The enterprise-wide view of system analysis stresses the theory behind and the generation of normalized relational database tables. Course includes material on user-centered requirements gathering and analysis. Prerequisites: BCIS 3389, and 4301 or approval of department head. Lab fee $15.

**BCIS 4344. Advanced System Design and Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This capstone course places a strong emphasis on combining the best practices of system design, including the professional, interpersonal, and technical skills required to analyze, propose, develop, and build modern large-scale business information software systems. The student will apply information engineering principles and theory to the design and development of a complex interactive system using software engineering and data management tools. This approach will involve all the stages of the full system development life cycle, through construction and implementation. This course serves to integrate the skills of the senior CIS student. Prerequisite: BCIS 4343 or approval of the instructor or department head Lab fee: $2.

**BCIS 4345. Network and Systems Security. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Studies the issues of Network and Systems Security as a continuous process involving analysis, implementation, evaluation and maintenance. Topics will include addressing computer-related risks, case analysis, and future trends. The course will provide approaches, techniques, and best practices for securing modern electronic data systems. Areas covered include electronic information and message security, database and file integrity, physical security, security management, security risk analysis, and encryption. Prerequisite: BCIS 3347 or approval of department head Lab fee: $2.

**BCIS 4347. Advanced Database Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Studies the theory and practice in the analysis, design, development, implementation, and optimization of working database applications on a variety of problems focusing on topics such as database administration. Prerequisite: BCIS 4301 or approval of instructor or department head Lab fee: $2.

**BCIS 4350. Management Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course investigates management issues related to business information systems designed to meet the informational needs of the various business subsystems. The concepts of systems development, security, privacy and ethics associated with information systems are stressed. Credit will be awarded for only 1 of the following courses: ACCT 4350, BCIS 4350, or MGMT 4350. Lab Fee $2.

**BCIS 4352. Structured Query Language. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of SQL, including relational database schema in SQL, formulating SQL queries and sub queries of varying complexity, embedding SQL statements in a host language, defining and querying data views in SQL, and other related topics. Prerequisite: BCIS 4301 or approval of instructor or department head Lab fee: $2.

**BCIS 4355. Global Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the international issues surrounding the planning, implementation, and management of global information systems. Topics covered include development and planning of offshoring programs, cultural aspects of information systems development and deployment and legal issues of global information systems. Prerequisite: Junior Standing.

**BCIS 4359. Strategic Application of Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A capstone course exploring the strategic alignment between business and information systems, the integration of information systems and other business functions to solve problems and facilitate decision making. Using case studies extensively, this course is designed to be taken by seniors during their last semester so they may demonstrate their ability to synthesize what they have learned over their course of study. Prerequisites: BCIS 3333 (or BCIS 3332), BCIS 3347, BCIS 3389, BCIS 4301, and BCIS 4350 or approval of department head.

**BCIS 4376. Network Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Studies communications architectures, protocols, and interfaces as they relate to network operating systems. Topics will include communications networking techniques such as circuit switching, packet switching, broadcast networking and internetworking. Also included will be installation, configuration, client handling, basic security, and troubleshooting of a network operating system. A modern network operating system will be used to provide extensive hands-on experience in configuring and administrating a network. Prerequisite: BCIS 3347 or approval of instructor or department head Lab fee: $2.

**BCIS 4378. Comprehensive Networking. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A comprehensive course requiring the student to plan, analyze, design, install, and configure a working computer network. Application exercises include the installation and configuration of a network operating system, the creation of required used interfaces, establishing network security, and establishing print services for a network. A modern network operating system will be used for extensive hands-on computer exercises to practice and demonstrate network skills. Prerequisite: BCIS 3347 or approval of instructor or department head Lab fee: $2.

**BCIS 4379. The Technology of E-Business. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course examines the linkage of organizational strategy and electronic methods of delivering products, services and exchanges in inter-organizational, national, and global environments. Information technology strategy and technological solutions for enabling effective business processes within and between organizations in a global environment are considered.

**BCIS 4385. Professional Development Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Professional-level enrichment for CIS majors with activities which may include participation in professional organizations, current events, research and presentations, job market analysis, interviewing and resume preparation. Prerequisite: 24 hours of BCIS/CIS courses or approval of department head. Lab Fee $15.

**BCIS 5086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
This course offers students the opportunity to study CIS topics and perform research within the student's area of interest as directed by the responsible professor. May be repeated as topics vary for a maximum of 6 semester hours. Prerequisite: Approval of the department head.

**BCIS 5304. Telecommunications for Managers. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Examines the management and utilization of data communication technologies including technical components, configurations, applications, protocols, legal issues, software and management issues, Local Area Network (LAN) technologies, and security issues. Prerequisite: BCIS 5311 or Approval of Department Head Lab fee: $2.

**BCIS 5307. Systems Analysis for Managers. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Investigates and compares various analysis approaches for application automation while highlighting management considerations for planning and developing automated systems. Systems life cycle models and case studies are used. Prerequisite: BCIS 5311 or Approval of Department Head Lab fee: $2.

**BCIS 5311. Managing Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Studies the management and use of information and technology as a resource to create competitive businesses, manage global operations, provide useful products and quality services to customers, whether public or private. Examines information systems management, intellectual property, privacy, organizational and societal impact, legal issues, ethics, security issues, decision making, strategic information systems, and management and organizational support systems. Lab fee: $2.

**BCIS 5316. Applied Database Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Examines the objectives and methodologies of database management. Topics include data models, database design, data dictionaries, fourth generation programming languages, data integrity, security, and privacy. Students use a commercial database. Prerequisite: BCIS 5311 or Approval of Department Head. Lab fee: $2.

**BCIS 5317. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of various issues, products, and technology current to computer information systems. May be repeated once for credit as topics vary. Prerequisites: Varies with topic. Lab fee $15.

**BCIS 5318. Quantitative Concepts in Computing. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An examination of measurements related to software projects and applying measurement techniques to information technology related problems. Analyses of programs and selected algorithms are performed. A statistical program will be used to analyze data. Lab fee $15.

**BCIS 5319. Decision Support Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Studies the use of decision support systems within organizations to support operational decisions. Explores the various systems used to collect, store, and analyze data, as well as systems to support collaborative decision making. Examines current topics within the field of decision support including: managerial decision models, collaborative decision environments, and knowledge management.

**BCIS 5320. Seminar on Computer Based Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will vary according to timeliness and special needs. May be repeated once for credit as topics vary.

**BCIS 5349. Topics in Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Develops programming proficiency in a modern programming language. Students complete many programming assignments to achieve necessary knowledge and skills. May be repeated once for credit as topics vary. Prerequisite: Approval of instructor. Lab fee $15.

**BCIS 5351. IT Project Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies the genesis of project management and its importance to improving the success of information technology projects. Project management concepts and techniques are emphasized, and students are required to apply these concepts by working on a group project as a project manager or active team member. Prerequisite: BCIS 5311 or Approval of Department Head.

**BCIS 5360. Multimedia Application Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Theory and application of the multimedia application development process. A review of the principles of user interface, design, graphic design, and interactivity including the appropriate application of these principles to multimedia will be conducted. Students will explore computer-based multimedia development tools and their use in the creation of various types of multimedia applications. The planning, design, production, and evaluation of interactive multimedia projects for delivery through a variety of media will culminate the course of study. Lab fee $15.

**BCIS 5365. Multimedia: Web Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Theory and application of the multimedia application development process of the creation of web-based authoring and scripting tools and their use in the creation of various types of web-based projects. The planning, design, projection, and evaluation of interactive web-based projects for delivery through a variety of media will culminate the course of study. Lab fee $15.

**BCIS 5366. Human Computer Interaction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the principles of human computer interaction including planning, design, and testing of effective application interfaces. Review of current literature in the field and its application to improving the interaction between people and computers.

**BCIS 5368. Topics in Multimedia. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of issues, theory, and application of current technology specific to multimedia development.

**BCIS 5379. The Technology of E-Business. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of the technical and business considerations for creating and operating an electronically based business. Students will study the environment from an operational and legal perspective, analyze the technologies available and implement an e-commerce project integrating database, web pages, and script languages. Lab fee $15.

**BCIS 5380. E-Business Application Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course examines issues related to supporting a business that uses the Internet and other on-line implementations. The course operates in a team environment simulating a business organization and requires the team develop and implement database and Internet technologies. Lab fee $15. Prerequisite Course: BCIS 5316: Applied Database Management or approval of department head.

**BCIS 5388. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is accepted. Prerequisite: BCIS 5351, consent of major advisor or approval of department head.

**BCIS 5390. Selected Topics in BCIS. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
An examination of various topics in the Computer Information Systems area with focus on current and recent developments. May be repeated as topics vary for a maximum of 6 semester hours. Prerequisite: Approval of department head.

**BCIS 5392. Business Intelligence Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Develops research skills related to the reactive and proactive use of data to analyze business decisions. Business environmental and internal data sets will be designed using data warehousing techniques. Students will use datamining, text mining, OLAP, or analytics used to improve decision making. Prerequisites: BCIS 5311 and BCIS 5316 or Approval of Department Head.

**BCIS 5395. Research Project with Laboratory. 3 Credit Hours (Lecture: 1 Hour, Lab: 5 Hours).**
Independent study course in specific areas of Information Systems. May be repeated for credit once when topics change. Prerequisites: Approval of department head. Lab fee $15.

**BCIS 5398. Research Methods in Information Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course examines timely topics related to computer-based systems. The course develops research skills, problem-solving skills, applies the scientific method, refines presentation skills, and promotes team involvement. The course operates in a distributed team environment using the Internet as its communication vehicle. Prerequisites: BCIS 5304, BCIS 5307, BCIS 5311, BCIS 5316, BCIS 5351, and BCIS 5392 or Approval of Department Head Lab fee: $2.

**BCIS 5399. Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 8 Hours).**
Supervised work experience in an information technology-related position with a public or private organization. May be repeated for a total of 6 hours credit. Prerequisite: 6 semester hours of prefix BCIS courses or equivalent and approval of internship coordinator or department head. Field experiences fee $50.

# Biology

## Courses

**BIOL 1100. Transitioning to University Studies in Biology/Biomedical Sciences. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of biology and biomedical disciplines.

**BIOL 1406. Biology for Science Majors. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Fundamental principles of living organisms will be studied, including physical and chemical properties of life, organization, function, evolutionary adaptation, and classification. Concepts of cytology, reproduction, genetics, and scientific reasoning are included. Laboratory activities will reinforce the fundamental principles of living organisms, including physical and chemical properties of life, organization, function, evolutionary adaptation, and classification. Study and examination of the concepts of cytology, reproduction, genetics, and scientific reasoning are included. Lab fee: $2.

**BIOL 1407. Biology for Science Majors II. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The diversity and classification of life will be studied, including animals, plants, protists, fungi, and prokaryotes. Special emphasis will be given to anatomy, physiology, ecology, and evolution of plants and animals. Laboratory activities will reinforce study of the diversity and classification of life, including animals, plants, protists, fungi, and prokaryotes. Special emphasis will be given to anatomy, physiology, ecology, and evolution of plants and animals. Lab fee: $2.

**BIOL 2300. Cell Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the study of cells, including structure and function of cellular components, bioenergetics, cellular transport and communication, and the cell cycle. Prerequisites: BIOL 1406.

**BIOL 2310. Essential Elements of Biology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The study of morphology, anatomy, growth, life cycles, ecology, behavior, classification, and uses of organisms. Human systems and tissues and mechanisms of heredity and metabolism will be introduced. The laboratory will give experience in the use of the microscope, dissecting procedures, and problem solving. Enrollment in this course is restricted to Interdisciplinary Studies Majors. Prerequisite: 3 hours of CHEM, PHYS, or GEOL Lab fee: $2.

**BIOL 2401. Anatomy and Physiology I. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Basic physiological principles and their applications in the study of the skeletal, muscular, and nervous systems are emphasized. Substantial microscopic observation required. Lab fee: $2.

**BIOL 2402. Anatomy & Physiology II. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Integrated study of human anatomy and physiology. Includes study of the structure and function of the human body including the following systems: endocrine, cardiovascular, immune, lymphatic, respiratory, digestive (including nutrition), urinary (including fluid and electrolyte balance), and reproductive (including human development and genetics). Emphasis is on interrelationships among systems and regulation of physiological functions involved in maintaining homeostasis. The lab provides a hands-on learning experience for exploration of human system components and basic physiology. Lab fee: $2.

**BIOL 2420. Microbiology for Non-Science Majors. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A survey of the microorganisms, their environments, and their interactions with multicellular organisms, particularly man. The course concentrates on the microorganisms which are pathogenic to man, human diseases, treatments for the diseases, and their prevention. Microorganisms need time to grow and therefore there will be several laboratory assignments throughout the course of the semester where students will be required to return the next day for about 15-45 minutes for culture analysis. Course is appropriate for pre-nursing majors. Prerequisites: 8 hours of BIOL or CHEM Lab fee: $2.

**BIOL 3103. Genetic Techniques. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
Application of modern genetic techniques to generate, analyze, and interpret data. Emphasis will be placed on the development of practical laboratory skills. Prerequisites: BIOL 3303 or concurrent enrollment. Lab fee: $2.

**BIOL 3303. Genetics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the study of genetics including the nature of genetic material, mechanisms of gene expression and inheritance, population genetics and evolution, and application of modern DNA technology. Prerequisites: 8 hours of BIOL with a grade of C or higher and CHEM 1411 or higher.

**BIOL 3340. Introduction to Marine Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
General considerations of the marine environment including habitats, biota, zoogeography, and humans' impact. Prerequisites: BIOL 1406, 1407.

**BIOL 3353. Ecology and Evolution. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The objective of this course is to convey a basic understanding of how life evolves, how organisms interact with their environments, and how evolutionary and ecological principles can be applied to a wide range of questions. Prerequisites: BIOL 1406, 1407 and 3303.

**BIOL 3380. Introduction to Virology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the basic principles in the study of viruses. It will provide a foundation to understanding virus architecture and nomenclature, virus replication cycles, mechanisms of viral entry and spread of infection, host responses to viral infections, laboratory research and diagnostics of viral diseases, and epidemiology of viral infections. Prerequisites: BIOL 3407.

**BIOL 3395. Pathogenic Microbiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the disease-producing capacities of various microorganisms with emphasis on the diagnostic procedure of isolation and identification. Prerequisites: BIOL 3407 with minimum grade of "C" or approval by the department head.

**BIOL 3402. Histology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to cellular ultrastructure. Study of vertebrate tissues and their arrangement in various organs. Prerequisite: 8 hours of BIOL Lab fee: $2.

**BIOL 3406. Comparative Vertebrate Anatomy. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
The morphology, physiology, and phylogeny of the organ systems of vertebrates. Laboratory study of representative vertebrates. Prerequisite: 8 hours of biology. Lab fee $10.

**BIOL 3407. Microbiology. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Study of microorganisms; characteristics, physiology, genetics, and their interrelations with humans. Substantial microscopic observation required. Microorganisms need time to grow and therefore there will be several laboratory assignments throughout the course of the semester where students will be required to return the next day for about 15-45 minutes for culture analysis. Prerequisites: 2 semesters of BIOL and 1 semester of CHEM, or 1 semester of BIOL and 2 semesters of CHEM, or approval by the department head. Lab fee $2.

**BIOL 3413. Molecular Biology. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
Fundamentals of gene expression, gene regulation, DNA metabolism and nucleic acid structure, recombinant DNA techniques and protein structure. Prerequisites: BIOL 3303 and 3103, and CHEM 2423.

**BIOL 3415. Plant Taxonomy. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Principles of plant taxonomy. Field and laboratory studies of common Texas wild flowers and trees with emphasis on identification, collection, and preparation of herbarium specimens. Prerequisites: 8 hours of BIOL with a grade of C or better, junior classification, or department head approval. Lab fee $2.

**BIOL 3420. Plant Pathology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Study of the various types of plant diseases and specific examples of each type. Emphasis upon identification, host-parasite interactions, pathogen dissemination, and control methods. Prerequisites: BIOL 1406, 3407 or approval by department head. Lab fee $10.

**BIOL 3430. Phycology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Hands-on training in the taxonomy, ecology, and ecophysiology of algae. Discussion of current uses of algae for water quality, biofuel, food production, forensic science, and nanotechnology. Prerequisites: BIOL 1406 and BIOL 1407 Lab fee: $2.

**BIOL 3436. Plant Physiology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of physiology of green plants with emphasis on nitrogen metabolism, respiration, mineral nutrition, photosynthesis, and growth. Prerequisites: 1 semester of BIOL with plant emphasis and one semester of organic chemistry. Lab fee $10.

**BIOL 3449. Invertebrate Zoology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The study of the morphology, taxonomy, biology, and phylogeny of the invertebrate animals, exclusive of the Insecta. Prerequisites: 12 hours of BIOL or approval by the department head. Lab fee $10.

**BIOL 3485. Immunology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Emphasis on the basic concepts of humoral and cell-mediated immunity. Laboratory: current techniques in experimental immunology and serology. Prerequisites: BIOL 2300, BIOL 3407 and one year of CHEM or approval by the department head. Lab fee: $2.

**BIOL 4086. Biology Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
A course open by invitation to capable juniors and seniors wishing to pursue a biological problem. Students are permitted and encouraged to work independently under the guidance of an instructor. May be repeated for credit, subject to the approval by the department head. Prerequisite: 14 hours of BIOL Lab fee: $2.

**BIOL 4090. Special Topics. 1-3 Credit Hours (Lecture: 3-9 Hours, Lab: 3 Hours).**
Deals with selected topics in biology. May be repeated for credit when topics vary. Prerequisite: approval of department head.

**BIOL 4185. Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Survey of biological literature, biological instrumentation, history of biology, and current trends in biological sciences. Grading in this course is satisfactory/unsatisfactory. Prerequisite: 12 hours BIOL or approval of department head.

**BIOL 4320. Behavioral Ecology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The aim of this course is to understand variation in behavior among species and among individuals within a species. The course will focus on how behavior affects an animal's ability to survive and reproduce. Prerequisites: 12 hours of biology or approval by department head.

**BIOL 4325. Conservation Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of conservation biology and the major issues that define the discipline. Study of value, threats to, and conservation of biodiversity. Conservation issues at the population and species levels, policy, and practical applications of the science will be included. Prerequisite: Course in Ecology, or department head approval.

**BIOL 4340. Developmental Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to basic principles of developmental biology. The course will include sections on classical embryology, the molecular basis of development, and evolution of development. In addition, students will read/discuss relevant articles from the primary literature. Prerequisites: BIOL 3303 or BIOL 3403.

**BIOL 4350. Vaccines. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will cover the basic principles in the study of vaccines by providing a foundation to the understanding of the immune response to vaccinations, development of vaccinations, and the significance of individual human and animal vaccines. Prerequisites: BIOL 3407.

**BIOL 4370. Organisms and Ecosystems of Texas. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A comparisons of the organisms and ecosystems of Texas. Prerequisites: BIOL 1406, BIOL 1407, CHEM 1411, CHEM 1412, and CHEM 2423, or approval of department head. Lab fee: $2.

**BIOL 4374. Biochemistry I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the basic principles of biological chemistry and to fundamental processes of plants, animals and microorganisms. Credit for both BIOL 4374 and CHEM 4374 will not be awarded. Prerequisites: BIOL 3407 with "C" or better, and either CHEM 2423 or both CHEM 2323 and 2123 with "C" or better.

**BIOL 4375. Biochemistry II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A detailed survey of intermediary metabolism. The metabolism of carbohydrates, lipids, proteins and nucleic acids, and the regulation of metabolism are emphasized. Credit for both BIOL 4375 and CHEM 4375 will not be awarded. Prerequisites: BIOL/CHEM 4374, or approval of department head.

**BIOL 4378. Biochemistry Lab. 3 Credit Hours (Lecture: 1 Hour, Lab: 5 Hours).**
Principles and applications of basic methodology for the isolation, purification, characterization, and quantitative determination of biologically important compounds. Credit for both BIOL 4378 and CHEM 4378 will not be awarded. Prerequisite: BIOL 4374 or CHEM 4374 Lab fee: $2.

**BIOL 4398. Current Topics in the Life Sciences. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Students will apply knowledge and skills learned in previous courses to address biological issues through writing, oral presentations, and other assessments. All majors must complete this course to graduate with a BS in Biology or BS in Biomedical Science. Prerequisites: Major in Biology or Biomedical Science and at least 80 hours of coursework completed, including BIOL 1406,BIOL 1407, BIOL 2300, BIOL 3103 and BIOL 3303, BIOL 3353, and BIOL 3407, or Department Head Approval.

**BIOL 4401. Ecology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Plants and animals in relation to their environment. Prerequisites: 2 semesters of BIOL or approval by the department head. Lab fee $10.

**BIOL 4430. Ornithology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the basic biology of birds, including origins, systematics, ecology, biogeography, physiology, anatomy, and reproductive biology. Laboratory emphasizes identification of regional avifauna and includes multiple field trips. Prerequisite: BIOL 1406 and BIOL 1407. Lab fee $2.

**BIOL 4440. Herpetology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A survey of the biology of amphibians and reptiles, with emphasis on phylogenetics, ecology, physiology, morphology, zoogeography, conservation, and taxonomy. Laboratory and field work will provide students with practical experience in collecting, identifying, and preparing specimens of regional species, as well as observing populations in natural settings. Prerequisites: BIOL 1406 and BIOL 1407. Lab fee: $2.

**BIOL 4441. Limnology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of aquatic communities and the physiochemical factors affecting the productivity of ponds, reservoirs, and streams. Experience in hydrographic survey morphometry. Prerequisites: 1 year of CHEM and 12 hours of BIOL, including BIOL 1406 and 1407 (or department head approval). Lab fee: $2.

**BIOL 4445. Parasitology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A survey of the various invertebrate parasites of medical importance with particular reference to epidemiology and the host-parasite relationship. Prerequisites: 12 hours of BIOL or approval by the department head. Lab fee $10.

**BIOL 4451. Mammalogy. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the evolution, anatomy, behavior, ecology, systematics, and basic biology of mammals. Laboratory work includes identification of regional mammals as well as techniques for the collection and preparation of mammalian specimens. Prerequisite: BIOL 1406 and BIOL 1407. Lab fee $2.

**BIOL 4460. Animal Physiology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An advanced course in the fundamentals of vertebrate physiology emphasizing physiologic mechanisms from a basic molecular/cellular level up to the level of organ systems, which include the nervous, endocrine, muscular, cardiovascular, respiratory, digestive and urinary systems. The basic physiologic mechanisms are presented in the context of human physiology, however, how selected animals are adapted to particular environments is addressed. Laboratory exercises involve the use of electronic instrumentation to measure physiologic responses non-invasively in human volunteers or in surgically prepared animals. Prerequisite: 12 hours of BIOL and one semester of organic chemistry with laboratory. Lab fee: $2.

**BIOL 4462. Ichthyology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the anatomy, behavior, ecology, evolution, taxonomy, and zoogeography of fishes. Field and laboratory work provide students with practical experience in collecting, identifying, and studying fishes. Emphasis will be placed on local fauna. Prerequisite: BIOL 1406 and BIOL 1407. Lab fee $2.

**BIOL 5086. Biological Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Independent research under the supervision of an instructor. A formal report will be submitted to the instructor. A student may not count more than 6 hours of biological problems toward a degree. Lab fee $10.

**BIOL 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until thesis is completed. Prerequisite: BIOL 5398 and consent of major professor.

**BIOL 5185. Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A graduate seminar course providing the opportunity for students to lead discussions on a current topic in Biology. Topics vary according to interests of faculty and/or students. May be repeated for credit as topics vary. Prerequisite: 12 hours of biology.

**BIOL 5302. Ecological Plant Physiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The interrelations of plants and their environments with emphasis on those which are subject to manipulation. Critical processes such as dormancy, photosynthesis, nutrition, reproduction, and water relations and their interactions in survival and biomass production. Prerequisite: BIOL 3426 or approval by the department head.

**BIOL 5309. Cellular Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of cellular morphology and function at the ultrastructural and molecular level. Prerequisites: Organic chemistry and 18 hours of BIOL or approval by the department head.

**BIOL 5320. Environmental and Restoration Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of human interactions with plants and animals within ecosystems with an emphasis on conservation and restoration ecology. Outdoor laboratories and restoration of plant communities are required.

**BIOL 5321. The Aquatic Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the basic principles involved in the ecology of the aquatic community including biotic and abiotic relationships. Emphasis placed on the sources of water contamination to include the effects of the contamination upon the changes in water chemistry and their possible biological implication. Prerequisite: 18 hours of BIOL and 2 semesters of CHEM or approval by the department head.

**BIOL 5330. Development of Modern Biological Concepts. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the development of biological concepts and their impact upon science and society. Biographical as well as contemporary readings will be involved. Prerequisite: Graduate classification or approval by the department head.

**BIOL 5331. Conservation Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of conservation biology and the major issues that define the discipline. Study of value, threats to, and conservation of biodiversity. Conservation issues at the population and species levels, policy, and practical applications of the science will be included. Prerequisites: BIOL 3403 and 4401 or approval of department head.

**BIOL 5340. Measuring Biological Diversity. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to give graduate students real world experience in acquiring and analyzing basic ecological data on the distribution and abundance of living organisms.

**BIOL 5361. Evolutionary Biology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of evolutionary patterns, mechanisms and processes at the organismal, chromosomal and molecular levels; modes of adaptation and the behavior of genes in populations. Prerequisite: BIOL 3043 or equivalent.

**BIOL 5380. Biological Scientific Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the basic principles of scientific writing with an emphasis on writing for the biological sciences. A specific focus of the course will be on the design, planning and writing of a research proposal in terms of problem selection, objectives, methodology, and formatting. Students will learn the types of literature and complete a literature search and review. Students will present their research proposal in an oral presentation.

**BIOL 5390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics in an identified area of biology, biochemistry or biotechnology. May be repeated for credit as topics vary. Prerequisites: 12 hours of biology and 8 hours of chemistry or approval of department head.

**BIOL 5398. Research Design and Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Statistical principles and techniques applicable to the procurement, analysis, and evaluation of quantitative data. Prerequisite: MATH 1314 or approval by the department head.

**BIOL 5399. Practicum, Field Problem, or Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised practice in specialized laboratory or professional settings. Prerequisites: 12 hours of biology and 8 hours chemistry or approval of department head.

# Business Law

## Courses

**BLAW 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a business law related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of department head.

**BLAW 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in business law. May be repeated with approval of the head of the Department. Prerequisite: Approval of department head.

**BLAW 4090. Special Topics in Business Law. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An examination of current topics in business law. Readings required from current business law publications and other related periodicals. May be repeated for credit when topics vary. Prerequisite: 9 hours in BLAW.

**BLAW 4333. Business Law II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the principles of law concerning agency, employment, partnerships, corporations, bankruptcy, secured transactions, creditor/debtor rights, insurance, real and personal property, laws impacting the regulatory environment of business such as consumer protection, environment, anti-trust, and securities law.

**BLAW 4334. Employment Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the laws relating to employment. Includes defining the employer-employee relationship; regulation of discriminatory practices in employment (Title VII, the 1964 Civil Rights Act, and other statutes); regulation of the employment environment; and testing and evaluation of employee job performance.

**BLAW 4384. International Business Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of international commercial business and the legal environment within which it operates. The study of traditional international concepts of treaties, sovereignty, public and private laws, customs laws, licensing, franchising, environmental and employment law. Special emphasis on contracts for international sale of goods (CISG), GATT and WTO Treaties, NAFTA, regional trade areas. Credit for both BLAW 4384 and BLAW 5384 will not be awarded.

**BLAW 4385. Seminar in Business Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of selected topics dealing with problems or unique needs of business law. May be repeated for credit as topics vary. Prerequisite: Approval from department head.

**BLAW 5303. Healthcare Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the federal and Texas legal system with an overview of the statutory and regulatory process as well as significant laws and regulations as applicable to the provision of and business of health care in this country.

**BLAW 5384. International Business Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of international commercial business and the legal environment within which it operates. The study of traditional international concepts of treaties, sovereignty, public and private laws, customs laws, licensing, franchising, environmental and employment law. Special emphasis on contracts for international sale of goods (CISG)< GATT and WTO Treaties, NAFTA, regional trade areas. In addition, a research based project will be required. Graduate standing required. Credit for both BLAW 4384 and BLAW 5384 will not be awarded.

# Business

## Courses

**BUSI 1100. Transitioning to University Studies in Business. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective.

**BUSI 1301. Business Principles. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Business as an integral part of society. Emphasis on ethics, social responsibility, the legal environment, and global perspectives.

**BUSI 1307. Personal Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of individual and family problems, includes financial planning, budgeting, use of credit, home ownership, savings, investment, and tax problems.

**BUSI 2301. Business Law I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the principles of law relating to law and ethics, the judicial system, constitution, tort and criminal law, law of sales, and commercial property.

**BUSI 2311. Business Statistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Methods of sampling, classifying, analyzing, and presenting numerical data; frequency distribution, averages, dispersion, times series analysis, correlation, and forecasting for business purposes.

**BUSI 3312. Business Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of effective communication, both verbal and written. Provides students the opportunity to gain practice in making decisions involving selection and organization of communication content, in choosing appropriate medium for presentation of information and developing effective business writing styles.

**BUSI 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a business related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of Instructor and Department Head.

**BUSI 4086. Business Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in business. May be repeated with approval of the head of the Department. Prerequisites: Approval of Instructor and Department Head.

**BUSI 4090. Special Topics in Business. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An examination of current topics in general business. Readings required from current general business publications and other related periodicals. May be repeated for credit when topics vary. Prerequisite: Approval of Instructor and Department Head.

**BUSI 4344. Introduction to International Business. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Broad coverage of key concepts and issues in international business. Emphasis on the environment of international business and the operations of the multinational firm.

**BUSI 4359. Business Strategy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A capstone course involving the integration of concepts and principles studied in accounting, economics, finance, management, marketing, quantitative methods, and other relevant disciplines. Includes problem solving and business decision making. Designed to be taken by senior business majors during their last semester. Prerequisite: FINC 3301, BUSI 2311, MGMT 3300, MKTG 3312; or approval of department head.

**BUSI 4385. Seminar in General Business. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of selected topics dealing with problems or unique needs of business. May be repeated for credit as topics vary. Prerequisite: Approval of Instructor and Department Head.

**BUSI 4387. Small Business Consulting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will develop skill in diagnosing and analyzing problems of actual small business clients and will prepare formal written reports and recommendations for client implementation.

**BUSI 4389. Global Business Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of basic international business concepts, cultural literacy, and discipline specific content are then applied to practical experiences and activities related to the foreign country visited. A required study abroad at the student's expense is required. Student may complete a maximum of six hours of COBA sponsored study abroad toward degree completion. Field assignment fee of $50.

**BUSI 5086. Business Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
This course offers students the opportunity to become acquainted with current research being conducted within the student's area of interest, directed reading of a number of sources selected in concert by the student and professor.

**BUSI 5354. Seminar in International Business. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Concepts and issues related to global business operations. Emphasis on the environment of international business and the operations of the multinational firm.

**BUSI 5365. Managerial Statistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Review of applied descriptive and inferential statistical calculations. Examination of statistics as a decision-making tool under uncertainty; focusing on probability, univariate/inferential and multivariate statistics. Emphasis is on interpretation of statistical information. Student will evaluate and interpret data, and report on current problems in the student's field of study. Prerequisite: PC based or undergraduate statistics. MS, Management and MS, HRM majors must have completed BUSI 5398 or have permission of the instructor.

**BUSI 5387. Small Business Consulting. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Students will develop skill in diagnosing and analyzing problems of actual small business clients and will prepare formal written reports and recommendations for client implementation, Prerequisites: 12 hours of graduate work and approval of SBI director.

**BUSI 5388. Seminar in Business Strategy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An integrated view of the business functions addressed in the MBA core curriculum. Applies case analysis methodology for evaluating complex business situations, developing strategic alternatives, and recommending effective solutions. Prerequisites: FINC 5303 and MKTG 5308. Pre- or corequisites: the remaining MBA core courses.

**BUSI 5389. Global Business Practices. 3 Credit Hours (Lecture: 4.5 Hours, Lab: 0 Hours).**
A study of basic international business concepts, cultural literacy, and discipline specific content are then applied to practical experiences and activities in the foreign country visited. A study abroad at the student's expense is required. Graduate students will be required to complete an extensive research project in addition to other course requirements. Student may complete a maximum of six hours of COBA sponsored study abroad toward degree completion. Prerequisites: Admission into a COBA graduate program and permission of the instructor.

**BUSI 5391. Seminar in Business. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected business topics of current importance to business. May be repeated for credit when topics vary.

**BUSI 5397. Evidence Based Decision Making. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theory and practice of Evidence-Based Decision Making are explored. Evidence from scientific literature, organization data, professional expertise and stakeholder interests are considered. Students will demonstrate that business decisions are the result of in depth research, data analysis and not the simple application of common sense.

# Chemistry

## Courses

**CHEM 1302. Essential Elements of Chemistry. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
An introduction to the science of chemistry with a broad overview of the essential elements of chemistry and real-life applications. Enrollment in this course is restricted to Interdisciplinary Studies majors. Lab Fee $2.

**CHEM 1407. Fundamentals of Chemistry. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A beginning chemistry course for students in applied sciences who need only one semester of general chemistry. The course includes the structure, properties and changes in matter, quantitative relationships in reactions, solutions, equilibrium, pH, buffers and nuclear chemistry. Not recommended for science majors or pre-professional students in health related fields. Does not meet prerequisite for CHEM 1412 or 2423. Lab fee $2.

**CHEM 1409. College Chemistry for Engineers. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to important concepts and principles of chemistry with an emphasis on areas considered most relevant in an engineering context. Registration will be restricted to engineering majors only. Engineering students many not receive credit for both CHEM 1408 and CHEM 1411. Prerequisites: MATH 1314, or MATH 2412, or MATH 2413, or concurrent enrollment. Lab fee: $2.

**CHEM 1411. College Chemistry I. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Topics to be covered include an introduction to fundamental chemical laws, atomic structure and its relationship to chemical bonding and the periodic properties of elements and compounds, stoichiometry, states of matter, and solutions. Suggested for science majors and pre-professional students. Prerequisite: Choose one of the following: MATH 1314, MATH 1316, MATH 2412, MATH 2413, or concurrent enrollment. Lab fee: $2.

**CHEM 1412. College Chemistry II. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Topics to be covered include a study of the chemical and physical properties of selected families of elements, an introduction to energy changes in chemical reactions, chemical equilibria, electrochemistry, rates of chemical reactions, nuclear chemistry, and semi-micro qualitative analysis. This course is a prerequisite for CHEM 2423. Prerequisite: CHEM 1411. Lab fee $2.

**CHEM 2123. Organic Chemistry I Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 4 Hours).**
Laboratory portion associated with lecture CHEM 2323 Prerequisite: CHEM 1412 or CHEM 1409(for Engineering Majors only) prerequisite or co-enrollment in CHEM 2323 Lab fee: $2.

**CHEM 2125. Organic Chemistry II Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 4 Hours).**
Laboratory portion associated with lecture CHEM 2325 Prerequisite: CHEM 2123; CHEM 2323; prerequisite or co-enrollment in CHEM 2325 Lab fee: $2.

**CHEM 2323. Organic Chemistry I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The first semester of a year sequence in the chemistry of carbon compounds involving their synthesis, reaction mechanisms, nomenclature, physical and spectral properties. Includes compounds of theoretical, biological, agricultural, and industrial importance. Prerequisite: CHEM 1412 or CHEM 1409(for Engineering Majors only).

**CHEM 2325. Organic Chemistry II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A continuation of CHEM 2323. The laboratory includes an introduction to qualitative organic analysis. This course is a prerequisite to all organic chemistry courses at the junior or higher level. Prerequisite: CHEM 2323 (2423).

**CHEM 2423. Organic Chemistry I. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
The first semester of a year sequence in the chemistry of carbon compounds involving their synthesis, reaction mechanisms, nomenclature, physical and spectral properties. Includes compounds of theoretical, biological, agricultural, and industrial importance. Prerequisite: CHEM 1412 or CHEM 1409(for Engineering Majors only) Lab fee: $2.

**CHEM 2425. Organic Chemistry II. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
A continuation of CHEM 2423. The laboratory includes an introduction to qualitative organic analysis. This course is a prerequisite to all organic chemistry courses at the junior or higher level. Prerequisite: CHEM 2423. Lab fee: $2.

**CHEM 3314. Geochemistry. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
A survey of the application of chemical principles to problems of geology. Topics include the origin and distribution of the elements in addition to exploring the behavior and distribution of various elements in igneous, metamorphic, and sedimentary rocks. Basic concepts of thermodynamics, solution chemistry, and isotope geochemistry will be discussed. Credit for both CHEM 3314 and GEOL 3314 will not be awarded. Prerequisite: CHEM 1412. Lab fee $10.

**CHEM 3407. Quantitative Analysis. 4 Credit Hours (Lecture: 2 Hours, Lab: 6 Hours).**
A study of the experimental and theoretical principles concerning gravimetric and volumetric analysis. Topics include data treatment, equilibrium, precipitation, neutralization, oxidation, reduction, potentiometry, and introduction to spectroscopy. Prerequisites: A grade of C or better in 8 hours of freshman CHEM; junior classification or approval of department head. Lab fee $10.

**CHEM 3423. Physical Chemistry I. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of chemical thermodynamics and its application to chemical equilibrium; the macroscopic properties of matter including real gases, solutions, and phase changes; chemical kinetics. Prerequisites: MATH 2414; PHYS 1402 or 2426 or approval of department head. Lab fee $10.

**CHEM 3424. Physical Chemistry II. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
An introduction to the microscopic properties of nature, including an introduction to quantum mechanics and its applications to atomic and molecular spectroscopy. Prerequisite: CHEM 3423 or approval of department head. Lab fee $10.

**CHEM 4086. Chemistry Problems: Undergraduate Research. 1-4 Credit Hours (Lecture: 0 Hours, Lab: 1-4 Hours).**
Conducting an undergraduate research project in Chemistry. May be repeated for credit. A maximum of four hours may be applied toward degree requirements in chemistry. Prerequisite: Approval of department head.

**CHEM 4160. Professional Lab Safety Techniques and Ethics in Chemistry. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
A capstone course intended for a chemistry major to take during their senior year. Lectures will cover the issues of ethics and lab safety in chemistry as well as the societal impacts of chemistry. The lab portion will be devoted to analyzing case studies, doing literature research, and giving professional style presentations. Prerequisite: Student must be within one year of graduation.

**CHEM 4327. Qualitative Organic Analysis. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
The identification of the principal classes of organic compounds. Prerequisite: CHEM 2425. Lab fee $10.

**CHEM 4328. Inorganic Chemistry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Discussion of the models of inorganic chemistry including atomic structure, chemical bonding, periodic properties, stereochemistry, reaction mechanisms, and coordination chemistry. Properties of specific elements and families are also presented Prerequisites: CHEM 2425 and junior classification or approval of department head.

**CHEM 4329. Polymers. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A basic study of polymer chemistry, with special emphasis on the effect of the structure of monomers upon the structure of the polymers, is presented. Prerequisite: CHEM 2425.

**CHEM 4345. Medicinal Chemistry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the principles of drug action including receptor-effector theories and the effects of physico-chemical properties on biological activity. The principles of drug design, synthesis, and metabolism will be presented. Prerequisites: CHEM 2425 and BIOL 1407.

**CHEM 4374. Biochemistry I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the basic principles of biological chemistry and to fundamental processes of plants, animals, and microorganisms. Credit for both BIOL 4374 and CHEM 4374 will not be awarded. Prerequisites: One semester of organic chemistry (2 semesters recommended), and 8 hours of biological science or approval of department head.

**CHEM 4375. Biochemistry II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A detailed survey of intermediary metabolism. The metabolism of carbohydrates, lipids, proteins and nucleic acids, and the regulation of metabolism are emphasized. Credit for both BIOL 4375 and CHEM 4375 will not be awarded. Prerequisites: BIOL/CHEM 4374, or approval of department head.

**CHEM 4378. Biochemistry Lab. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
Principles and applications of basic methodology for the isolation, purification, characterization, and quantitative determination of biologically important compounds. Credit for both BIOL 4378 and CHEM 4378 will not be awarded. Prerequisite: BIOL 4374 or CHEM 4374 or concurrent enrollment, or approval of the department head. Lab fee $15.

**CHEM 4408. Instrumental Analysis. 4 Credit Hours (Lecture: 2 Hours, Lab: 6 Hours).**
A study of the theory and use of instruments for chemical analysis. Techniques include absorption spectroscopy, nuclear magnetic resonance, atomic absorption, flame emission, mass spectroscopy, chromatography, potentiometry, and polarography. Prerequisites: CHEM 3407 and 1 semester of organic chemistry or approval of department head. Lab fee $10.

**CHEM 4477. Environmental Chemistry. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This is an undergraduate course intended for any student who has completed College chemistry 1 and college chemistry II with an interest towards Environmental Science. This course includes both lecture and laboratory components. Lectures will cover topics which provide the understanding of interactions between chemical compounds whether anthropogenic or natural with the ecosystem. This course will provide qualitative and quantitative knowledge on effects of changes in water, soil, air and its effects on the environment. The lab portion includes bench scale and field scale experiments to put theory to practice. Water and soil samples will be collected from different sources and lab made samples will be used to detect and analyze the various types of pollutants and their mitigation methods will be discussed. Prerequisite: CHEM 1412. Lab fee: $2.

**CHEM 5086. Chemical Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Independent research in the laboratory or in the library under the guidance of a member of the graduate faculty. Up to 6 hours may be taken.

**CHEM 5310. Environmental Chemistry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of the impact of chemistry on the environment to include topics on air, water, and soil pollution, with special emphasis on water. Beneficial chemical modification of the environment will be covered.

# Child Development and Family Studies

## Courses

**CHFS 1100. Transitioning to University Studies in Child and Family Studies. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
An introduction to and analysis of the culture child and family studies. Students will examine best practices when working with families and children from diverse backgrounds and needs through directed field experiences. This course also meets the First Year Seminar requirement.

**CHFS 1201. Basic Clothing Construction. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Basic construction of garments taught through lecture, demonstration, instructional media, and laboratory experience. No experience in clothing construction required. A student must earn a grade of at least a "C" to progress to HECO 1328. This course will not count for degree credit for the BS degree in HS with teacher certification. Lab fee $15.

**CHFS 1304. Infant and Toddler Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Emphasis is on the child from conception through younger years with a study of growth and development in the family setting. Directed observation in approved settings is required.

**CHFS 1307. Personal and Professional Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**

**CHFS 3300. Child Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the child's physical, mental, social, and emotional development from preschool to adolescence. Emphasis is placed on the three year old to adolescent child and those factors which influence his/her growth. Credit for both CHFS 3300 and FACS 3300 will not be awarded. Prerequisite: Junior classification or approval of department head.

**CHFS 3305. Management of a Licensed Child Care Program. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Basic principles of the management of licensed child care programs are studied. Experience is gained in using guidance techniques, methods and materials appropriate to the pre-school level. The class plans and operates a child care center. Credit for both CHFS 3305 and FACS 3305 will not be awarded.

**CHFS 3309. Lifespan Of The Family. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the developmental tasks throughout the family life cycle. Stages of the family from the newly established family through the aging family are examined. Current issues such as family planning, divorce and single parenting, alternate family forms, dual career families, and aging of family members are included.

**CHFS 3310. Methodology of Family Life Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An understanding of the philosophies and principles of family life education, including knowledge of the family life certification process and content areas. This course will include a survey and critique of various existing family life education programs as well as the development, implementation, and evaluation of new evidence-based programs. Prerequisite: Junior Classification or Approval of Department Head.

**CHFS 3311. Human Sciences Occupations I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the organization and management of Family and Consumer Sciences departments and programs within the secondary schools. State requirements for programs, physical facilities, advisory councils, and models for program delivery are included.

**CHFS 3312. Human Sciences Occupations II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of selected occupations within the field of Family and Consumer Sciences. Special emphasis will be given to the skills and content needed for program delivery to meet the needs of secondary and challenged students in contemporary society.

**CHFS 3315. Concept Development in Early Childhood. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An exploration of theory and practice in teaching science, mathematics, social studies/diversity and technology to young children. An emphasis is placed on developmentally appropriate practices that facilitate skill development. This course includes 8 hours of field experience in an early childhood classroom. Prerequisite: CHFS 3300 or approval of Department Head.

**CHFS 3316. Human Intimacy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A functional approach to the understanding of the interpersonal dynamics and choices in primary and secondary relationships such as those with friends, dating partners, and potential mates. The study will include a brief historical and cross-cultural perspective with emphasis on the roots of modern American customs and the rituals of dating and mate selection. Current issues in human sexuality are included. A major component of the class is a study of interpersonal communication. Prerequisite: PSYC 2301.

**CHFS 3333. Family Financial Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Special emphasis is given to the use of family finances in achieving goals. Consideration made for financial protection and financial planning for the family life cycle.

**CHFS 3344. Creative Arts and Literature for Children. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An exploration of theory, practice, and materials for teaching young children music, movement, visual arts, and literacy. An emphasis will be placed on developmentally appropriate practice including process-focused activities and skill development. Prerequisites: CHFS 3300.

**CHFS 3353. Child and Youth Guidance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An exploration of child and youth guidance strategies in the context of family and group settings. The history and theories of guidance strategies as well as practical application of positive guidance strategies will be discussed. Methods to promote pro-social behavior will be examined. Prerequisites: CHFS 3300.

**CHFS 4085. Internship Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
This internship includes supervised, field-based activities in licensed daycare facilities. Major emphasis is placed on the developmentally appropriate instructional strategies and professional practices designed to improve teaching and child care performance. Students are required to conduct a reflective analysis of their internship activities. May be repeated for credit. Prerequisite: CHFS 3300.

**CHFS 4309. Parenting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A contemporary approach to basic principles and skills needed for effective parenting. Study will include assessment of parenting programs and techniques. Emphasis is placed on creating nurturing home environments through the life cycle. Prerequisite: CHFS 3300.

**CHFS 4317. Environments in Early Childhood. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An exploration of the Early Childhood environments, including plans, procedures, physical environment (use of learning centers) and activities for development and assessment of young children. Additionally, this course will examine current issues facing professionals in early childhood settings. Prerequisites: CHFS 3300.

**CHFS 4340. Play Theory and Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Exploration of historical and contemporary therapeutic play theory and research from infancy through young adulthood. Play environments, learning objectives for various age groups, and play therapy are covered.

**CHFS 4345. Child Life. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A review of the historical and theoretical perspectives on the development of the child life field and information on fundamental skills required to help children and families cope with the stress of the health care experience. Prerequisites: CHFS 1304, 3300.

**CHFS 4350. Policies and Ethical Standards. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of moral, ethical, and legal issues faced by professionals working with children and families. Students will learn to assess each situation independently and evaluate alternative approaches to promoting optimal development. Information on the legal aspects of early childhood intervention, working with young children with special needs, and the ethical treatment of families in poverty will be included. Prerequisite: CHFS 3300, Senior Classification or approval of Department Head.

**CHFS 4356. Research Methods in Human Sciences. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Current research issues and the importance of research in Human Sciences will be discussed. Main tasks include review of literature, introduction to the scientific method of inquiry, analysis of results, and completion of a research paper. Prerequisite: CHFS 3300.

**CHFS 4360. Preprofessional Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Basic information for professional growth including: information relevant to human sciences careers; business interactions; global business-related social and cultural differences; professional correspondence; development of professional marketing tools such as interview skills, preparation of cover letters and resumes Prerequisite: CHFS 3300.

**CHFS 5086. Special Problems. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Open to graduate students who are capable of developing a problem independently. Problems chosen by the student and approved in advance by the instructor and department head. Prerequisite: Graduate major in College of Education. Prerequisite: Graduate major in College of Education.

**CHFS 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: Completion of all course work required by the degree and consent of the major professor.

**CHFS 5313. Advanced Human Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of theories that relate to human development and contemporary research findings in areas of the field of human development. Developmental domains and children's relationships within family and society will be emphasized.

**CHFS 5320. Social and Emotional Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Contemporary theory and research related to social and emotional development from infancy through young adulthood. Discussion of the impact of social and emotional development on behavior and interpersonal relationships.

**CHFS 5321. Family Theories and Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of family theories and research which employ the contextual framework of the family as a system and which explain family of origin, family functioning, family structure, and family process. Application of theory and research will include an understanding of the various levels of family functioning as a model for developing family support and intervention plans.

**CHFS 5330. Interpersonal Relationships. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A functional approach to the understanding of the interpersonal dynamics and choices in primary and secondary relationships such as those with friends, dating partners, and potential mates. The study will include a brief historical and cross-cultural perspective with emphasis on the roots of modern American customs and the rituals of dating and mate selection.

**CHFS 5339. Language and Cognitive Development in Childhood. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of current research in preschool language and cognitive development; methods for continuing language and cognitive growth based on the demonstrated processes of brain development.

**CHFS 5340. Advanced Child Life. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A review of the historical and theoretical perspectives on the development of the child life field and information on fundamental skills required to help children and families cope with the stress of the health care experience. This course is required for the Child Life Specialist Certification.

**CHFS 5347. Child and Family Advocacy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the knowledge, skills, and strategies necessary to understand the impact of social policies and institutional practices on the well being of children and families.

**CHFS 5350. Advanced Methods of Family Life Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An understanding of the philosophies and principles of family life education, including knowledge of the family life certification process and content areas. This course will include a survey and critique of various existing family life education programs as well as the development, implementation, and evaluation of new evidence-based programs.

**CHFS 5360. Research Methods in Human Sciences. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Course will provide an in-depth review of study design and data analysis methods. Both qualitative and quantitative approaches will be covered, and the publication and peer-review process will be discussed.

# Criminal Justice

## Courses

**CRIJ 1100. Transitioning to University Studies in Criminal Justice. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual discipline perspective. These skill sets are presented in the context of cultural awareness perspectives and opportunities to explore diversity.

**CRIJ 1301. Introduction to Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the history, philosophy, and operations of the American criminal justice system. Topics include the nature of crime and justice, the history and development of the modern criminal justice system and the role of police, judiciary, and corrections in society.

**CRIJ 1306. Court Systems and Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the role of the judiciary in the criminal justice system. Topics include right to counsel, pre-trial release, grand juries, adjudication process, and sentencing. Prerequisite: In progress CRIJ 1301.

**CRIJ 1310. Fundamentals of Criminal Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the nature of criminal law, philosophical and historical development, major definitions and concepts, classification of crime, elements of crimes and penalties using Texas statutes as illustrations, and criminal responsibility. Prerequisite: in progress CRIJ 1301.

**CRIJ 2313. Correctional Systems and Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to corrections as a profession. Topics include organization of correctional agencies, the role of corrections in society, correctional philosophies and agency operations, and current and emerging issues. Prerequisite: in progress CRIJ 1301.

**CRIJ 2328. Police Systems and Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the police profession. Topics include organization of law enforcement agencies, the police role in society, police operations, discretion, corruption, and current and emerging issues. Prerequisite: In progress CRIJ 1301.

**CRIJ 2335. Criminal Investigation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Investigative theory, collection and preservation of evidence, sources of information, interview and interrogation, uses of forensic sciences, and case and trial preparation. Prerequisite: In progress CRIJ 1301.

**CRIJ 3300. Juvenile Delinquency. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the nature, extent, causation, treatment, and prevention of juvenile delinquency. A survey of the procedures and operations of the juvenile justice agencies will also be considered.

**CRIJ 3301. Survey of Forensic Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduces the scientific methods that currently play a major role in solving crimes. It provides background information on various forensic disciplines together with the basic techniques utilized by forensic scientists in analyzing common types of physical evidence.

**CRIJ 3305. Criminology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study and critical appraisal of various theories of crime causation, including an examination of classical, biological, psychological, and sociological perspectives on the etiology of crime.

**CRIJ 3308. Comparative Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of criminal justice systems around the world. The organization, administration, and philosophy of various criminal systems will be examined, along with the cultural and historical environment in which they developed and exist. Prerequisite: 18 hours CRIJ or approval of department head.

**CRIJ 3310. Criminal Justice Supervision and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of theories and principles of supervision as applied to criminal justice agencies. Topics include organization, leadership, motivation, human resources flow, and managerial ethics.

**CRIJ 3311. Techniques of Interviewing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of interview and interrogation techniques. Topics include preparation, environmental and psychological factors, legal issues, and ethics.

**CRIJ 3313. Professional Writings in Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The process of developing and documenting information related to criminal justice field work and graduate studies in criminology and criminal justice, including researching, editing, revising, and creating technical reports, case narratives, grant applications and reports, academic and field related research proposals, training modules, and correspondence. Students will use word processing and related graphic software. Prerequisite: Criminal Justice major (BS and BAAS) and ENGL 1301 and ENGL 1302.

**CRIJ 3315. Rules of Criminal Evidence. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An analysis of the procedures and rules of evidence applied to the acquisition, offering, admissibility, and presentation of evidence from the crime scene, courtroom, and appellate court perspectives.

**CRIJ 3330. Community Corrections. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the philosophy, administrative procedures, and operational techniques used in the community based treatment and supervision of offenders.

**CRIJ 3340. Homeland Security. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in-depth study of strategic, legal, policy, operational, and organizational issues associated with the defense of the U.S. homeland from foreign and domestic terrorist threats. Topics include psychology of mass movements, terrorists' ideology, religion and terror, legal issues in homeland security, weapons of mass destruction, effective interfacing between local, state, and federal agencies, emergency management operations and dealing with mass casualties.

**CRIJ 3350. Media, Crime, and Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine the representation of crime and criminal justice in popular culture, in particular in television and film. The purpose of this class is to explore the role of media representation in the understanding of criminal justice issues and policies.

**CRIJ 3360. Sex Crimes. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine sexual offenses and sexual offenders; including pornography, rape, sexually motivated homicides, and nuisance and dangerous sex crimes. The course will study the various typologies of these offenders, as well as their impact on the Criminal Justice System.

**CRIJ 4086. Problems in Criminal Justice. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Independent reading, research and discussion. Entry into this course will be arranged with the department head.

**CRIJ 4301. Gender, Crime, and the Criminal Justice System. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the issues related to women as victims, offenders, and professionals in the criminal justice system.

**CRIJ 4303. Crime, Justice, and Social Diversity. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the complex interrelationship between cultural diversity, crime, and the American Criminal Justice System.

**CRIJ 4312. Criminal Justice Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course presents an analysis of contemporary ethical issues in crime and justice. Classical and contemporary ethical theories will be applied to the discussion of such issues as discretion, corruption, use of force, racism, deception, professionalism, and the nature and meaning of justice.

**CRIJ 4316. Methods of Criminal Justice Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is an introduction to the methods of criminological and criminal justice research, with emphasis on research ethics, research design, and methods of data collection and analysis. Prerequisites: Criminal Justice major (BS and BAAS) and ENGL 1301 and ENGL 1302.

**CRIJ 4318. Criminal Justice Statistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the elementary forms of statistical analysis, including measures of central tendency, variation, the normal curve and Z scores, measures of difference, regression analysis, and correlations. Emphasis will be placed on application of statistical analysis to criminal justice research and planning using the SPSS data analysis program. Prerequisite: CRIJ 4316.

**CRIJ 4324. Penology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the structure and function of correctional systems and how various philosophies of correctional treatment affect the operation of confinement institutions.

**CRIJ 4325. Advanced Investigation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced criminal and civil investigation topics will be covered. An examination of frequently used, yet special investigative techniques will also be introduced. Emphasis will be placed on crime scene processing, crime scene analysis, forensic evaluations, investigative techniques, and investigative surveys.

**CRIJ 4326. Criminal Procedure. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the fundamental principles of criminal procedural, including key concepts related to the Fourth, Fifth, Sixth, and Fourteenth Amendments.

**CRIJ 4385. Seminar: Special Topics in Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will vary according to timeliness and special needs. May be taken more than once for credit. Prerequisites: CRIJ 1301 or approval of the department head.

**CRIJ 4387. Seminar: Study Away/Abroad. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will vary according to timeliness and special needs. May be taken more than once for credit. This course requires travel within the US or internationally.

**CRIJ 4398. Criminal Justice Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is designed for upper level students in Criminal Justice. Students will learn the applicability of research methods, criminal justice theory; along with current issues into real-life job related scenarios. Specifically, students will have the opportunity to implement what they have learned in prior criminal justice classes to their current and/or future careers. This is a writing intensive course. Prerequisites: In progress Senior classification. Restricted to Criminal Justice majors. CRIJ 3305 and CRIJ 4316 and ENGL 1301 and ENGL 1302.

**CRIJ 4431. Criminal Justice Field Experience. 3 Credit Hours (Lecture: 0 Hours, Lab: 8 Hours).**
Application and integration of academic content and development of skills within a criminal justice setting. Entry into this course will be arranged with the internship coordinator. May be taken more than once for credit. Prerequisite: In progress junior classification.

**CRIJ 5086. Problems in Criminal Justice. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Independent reading, research, and discussion. Entry into this course will be arranged with the department head. Students may repeat this course for a total of 6 hours credit.

**CRIJ 5097. Thesis. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
The completion and defense of the Thesis. The student must be registered in CRIJ 5340 the semester in which he/she receives his/her master's degree. Students must enroll in CRIJ 5340 every semester (except summer) for at least 1 credit hour until graduation. Prerequisite: Approval of graduate program director.

**CRIJ 5300. Statistical Methods for Criminal Justice I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of basic and advanced descriptive and inferential statistics, with an emphasis on applications in the criminal justice system. Credit will not be awarded for both CRIJ 5300 and CRIJ 6300. Prerequisite: CRIJ 5398.

**CRIJ 5301. Foundations of Criminological Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In-depth examination of major theoretical perspectives of crime and deviancy. Theories will be analyzed for their logical and empirical adequacy in light of what is known about the distribution of crime and deviant behavior. Credit will not be awarded for both CRIJ 5301 and CRIJ 6301.

**CRIJ 5304. The American Judiciary. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A critical evaluation of the role courts play in the American criminal justice system. Topics include the structure, function, and operations of the courts at the state and federal level. Credit will not be awarded for both CRIJ 5304 and CRIJ 6304.

**CRIJ 5305. The Juvenile Justice System. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A critical analysis of the policies and practices of the juvenile justice system.

**CRIJ 5308. Corrections. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A critical analysis of the issues, problems, trends, and prospects faced by the administration of the American correctional system to include the impact of legal and social change on the correctional agencies and an evaluation of current research in the field.

**CRIJ 5309. Victimology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to the field of victimology. General topics covered in this course will include, but are not limited to: an analysis of the characteristics of crime victims; victim reporting and non-reporting patterns; the treatment of victims by the various segments of the criminal justice system; victim assistance programs; and the issue of compensation and/or restitution for victims of crime.

**CRIJ 5310. The Criminal Justice System. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the criminal justice system in the United States. This course includes a systems approach to the study of criminal justice and the interrelationships of the various components. The social and political issues related to the criminal justice system are examined in depth.

**CRIJ 5314. Directed Study in Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Demonstration of competency in a specialized area of criminal justice through the completion of a substantial research project incorporating independent study and critical analysis of the topic area. May be repeated one time for credit as topic varies. Prerequisite: Departmental permission is required.

**CRIJ 5315. Special Topics in Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of selected topic(s) directly related to criminal justice. May be repeated for credit as topic varies. (Course will be offered not more than one semester each year.).

**CRIJ 5316. Special Topics in Criminology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of selected topic(s) directly related to criminology. May be repeated for credit as topic varies (Course will be offered not more than one semester each year).

**CRIJ 5320. Policing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in depth study of the philosophical, operational, and social aspects of law enforcement.

**CRIJ 5321. Management of Criminal Justice Personnel. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An investigation of the personnel decision-making process used within criminal justice agencies. Areas to be investigated include recruitment, training, continuing education requirements, performance evaluation, fair employment practices, termination, and allocation of personnel. Credit will not be awarded for both CRIJ 5321 and CRIJ 6321.

**CRIJ 5322. Advanced Criminal Justice Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The practical implications of moral philosophy and ethics in a free society during the day-to-day administration of a criminal justice agency will be discussed. Credit will not be awarded for both CRIJ 5322 and CRIJ 6322.

**CRIJ 5323. Organizational Communications in Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the study of organizational skills in criminal justice systems. Student cannot receive credit for both CRIJ 5323 and CRIJ 6323.

**CRIJ 5330. Criminal Justice in a Diverse Society. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a study of the complex interrelations of crime, justice, and social diversity in a free society. The effect of justice system policy on social inequality is studied, and theories of social and economic justice are presented in terms of their effect on crime and criminal justice.

**CRIJ 5335. Gender, Crime and Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an overview of issues related to women as victims, offenders, and professionals in the criminal justice system.

**CRIJ 5340. Legal Aspects of Criminal Justice Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A consideration of the major legal issues of criminal justice management and the effect of constitutional provisions, statutes, ordinances, and judicial decisions in justice administrations. A discussion of the legal aspects of selection, promotion, assignment, and termination of justice employees. Emphasis is on the possible liabilities of managers and agencies for failure to adhere to legal requirements.Credit will not be awarded for both CRIJ 5340 and CRIJ 6340.

**CRIJ 5343. Grant Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to provide students with the knowledge and skills to perform one of the most critical functions for any public or nonprofit sector agency today: gaining funds through proposals. Students learn how to find a funding source among various public and private sources and how to plan and write a proposal.

**CRIJ 5344. Grant Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Designed for grant management for public agencies and nonprofit organizations. Understanding budget development, accepting and managing grant and contract awards, grants-management system(s), reporting, record keeping, and accountability, audit requirements, ethics in the grants environment, and program evaluation.

**CRIJ 5345. Program Evaluation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Describes the theory and methodology for the design of social research and demonstration projects and the application of analytic and statistical methods for evaluating public programs. Focus is on the application of evaluation methods and techniques of data interpretation. Report preparation is emphasized.

**CRIJ 5346. Advanced Program Evaluation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In this course, students will design and carry out an evaluation of a program that incorporates current evaluation methods and principles derived from research, theory, practice wisdom, and their own experience. These occur within a field placement agency or their own workplace agency. Prerequisite: CRIJ 4345 Program Evaluation.

**CRIJ 5349. Transnational Trafficking. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine transnational trafficking issues such as human trafficking, drug trafficking, illegal arms trafficking, and other trafficking of illicit substances. The course will explore: key theories, domestic and international policy, enforcement strategies and the role of non-governmental organizations. Students may not receive credit for both CRIJ 5349 and CRIJ 6349.

**CRIJ 5351. Terrorism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the origins, nature, and operational characteristics of terrorist groups. Students are exposed to topics ranging from the definition of "terrorism" to the unique characteristics of terrorist cells in the United States and abroad. Particular emphasis is on historical and contemporary terrorist attacks against the United States. Students may not receive credit for both CRIJ 5351 and CRIJ 6351.

**CRIJ 5352. Homeland Security. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines principles and practices associated with the emerging discipline of homeland security, including key policies, directives, national plans, and legislation that shape and homeland security. Students may not receive credit for both CRIJ 5352 and CRIJ 6352.

**CRIJ 5353. Global Cyber-Security. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course presents a conceptual overview of information security and its impact on the global stage. Topics include: current trends and over all landscape in information warfare, cybercrime techniques, cyber-terrorism, and information security fundamentals. Included is an emphasis on policy implications for law enforcement at the national level. Student will not be awarded credit for both CRIJ 5353 and CRIJ 6353.

**CRIJ 5354. Introduction to Digital Forensics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the study of digital and computer forensic evidence, search and seizure, chain of custody, and digital storage devices.

**CRIJ 5355. Cellular Forensics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of collection and preservation of digital evidence derived from cellular technologies in a laboratory environment. This study will include the use of hardware and software needed to perform cellular and mobile device forensic investigations including MPE+ and associated connectivity kits. Prerequisite: CRIJ 5354.

**CRIJ 5356. Digital Forensics Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of evidence collection through a laboratory environment. The course presents students with the working knowledge of the collection, preservation, presentation, and reporting of evidence obtained in a digital investigation. The topics also include encryption techniques and common issues with storage mediums. The course will make use of industry standard software including EnCase and FTK. Prerequisite: CRIJ 5353.

**CRIJ 5364. Crime Mapping, Analysis, and Predictive Modeling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the study and application to crime mapping and analysis techniques. Student cannot receive credit in both CRIJ 5364 and CRIJ 6364. Prerequisites: CRIJ 5300 and CRIJ 5301.

**CRIJ 5365. Intersection of Domestic and Military Policing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the comparative study and analysis of domestic and military policing. Student cannot receive credit for both CRIJ 5365 and CRIJ 6365.

**CRIJ 5366. Crime and Violence Prevention and Intervention. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines crime prevention and intervention as a potential alternative or complement to traditional criminal justice system responses to crime. Student cannot receive credit for both CRIJ 5366 and CRIJ 6366. Prerequisite: CRIJ 5301.

**CRIJ 5375. Executive Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the governing principles of organizational leadership within criminal justice and related organizations. Topics will include leadership theory, ethics of leadership, and the role of leadership in garnering public trust. Students may not receive credit for both CRIJ 5375 and CRIJ 6375.

**CRIJ 5390. Independent Study. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specific topic and contents of the course will be determined by the student in consultation with the instructor, with whom the student meets regularly for supervision of the study. May be repeated to a maximum of six semester hours. Permission of the graduate advisor required. Prerequisites: Instructor permission.

**CRIJ 5398. Research Methods I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of scientific research methods used in the criminal justice system. Includes a review and critique of research on crime causation, law enforcement, courts, and corrections. Emphasis will be place on quantitative research methods. Credit will not be awarded for both CRIJ 5398 and CRIJ 6398.

**CRIJ 5399. Practicum, Field Problems, Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in public service professions. Major emphasis is placed on the student's involvement in successful practices in the area of professional interest. Field experience fee $50.

**CRIJ 6300. Statistical Methods for Criminal Justice I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of basic and advanced descriptive and inferential statistics, with an emphasis on applications in the criminal justice system. Credit will not be awarded for both CRIJ 5300 and CRIJ 6300. Prerequisites: CRIJ 5398 or CRIJ 6398.

**CRIJ 6301. Foundations of Criminological Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In-depth examination of major theoretical perspectives of crime and deviancy. Theories will be analyzed for their logical and empirical adequacy in light of what is known about the distribution of crime and deviant behavior. Credit will not be awarded for CRIJ 5301 and CRIJ 6301.

**CRIJ 6302. Statistical Methods for Criminal Justice II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of advanced inferential statistics, with an emphasis on applications in the criminal justice system. Emphasis will be placed on multivariate regression analysis. Prerequisite: CRIJ 5300, CRIJ 6300, or equivalent.

**CRIJ 6303. Advanced Criminological Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In-depth examination of contemporary theoretical perspectives of crime and deviancy. Theories will be analyzed for their logical and empirical adequacy in light of what is known about the distribution of crime and deviant behavior. Emphasis will be placed on integrated theories and theory construction.

**CRIJ 6304. The American Judiciary. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A critical evaluation of the role courts play in the American criminal justice system. Topics include the structure, function, and operations of the courts at the state and federal level. Credit will not be awarded for both CRIJ 5304 and CRIJ 6304.

**CRIJ 6308. Corrections. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A critical analysis of the issues, problems, trends, and prospects faced by the administration of the American correctional system to include the impact of legal and social change on the correctional agencies and an evaluation of current research in the field.Credit will not be awarded for CRIJ 5308 and CRIJ 6308.

**CRIJ 6309. Victimology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to the field of victimology. General topics covered in this course will include, but are not limited to: an analysis of the characteristics of crime victims; victim reporting and non-reporting patterns; the treatment of victims by the various segments of the criminal justice system; victim assistance programs; and the issue of compensation and/or restitution for victims of crime. Credit will not be awarded for CRIJ 5309 and CRIJ 6309.

**CRIJ 6310. The Criminal Justice System. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the criminal justice system in the United States. This course includes a systems approach to the study of criminal justice and the interrelationships of the various components. The social and political issues related to the criminal justice system are examined in depth. Credit will not be awarded for CRIJ 5310 and CRIJ 6310.

**CRIJ 6315. Special Topics in Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of selected topic(s) directly related to criminal justice. May be repeated for credit as topic varies.

**CRIJ 6316. Special Topics in Criminology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of selected topic(s) directly related to criminology. May be repeated for credit as topic varies. This course may be repeated for a maximum credit of up to 9 hours.

**CRIJ 6321. Management of Criminal Justice Personnel. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An investigation of the personnel decision-making process used within criminal justice agencies. Areas to be investigated include recruitment, training, continuing education requirements, performance evaluation, fair employment practices, termination, and allocation of personnel. Credit will not be awarded for both CRIJ 5321 and CRIJ 6321.

**CRIJ 6322. Advanced Criminal Justice Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The practical implications of moral philosophy and ethics in a free society during the day-to-day administration of a criminal justice agency will be discussed. Credit will not be awarded for both CRIJ 5322 and CRIJ 6322.

**CRIJ 6323. Organizational Communication in Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the study of organizational skills in criminal justice systems. Students cannot receive credit for both CRIJ 5323 and CRIJ 6323.

**CRIJ 6330. Criminal Justice in a Diverse Society. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a study of the complex interrelations of crime, justice, and social diversity in a free society. The effect of justice system policy on social inequality is studied, and theories of social and economic justice are presented in terms of their effect on crime and criminal justice. Credit will not be awarded for both CRIJ 5330 and CRIJ 6330.

**CRIJ 6335. Gender, Crime and Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an overview of issues related to women as victims, offenders, and professionals in the criminal justice system. Credit will not be awarded for both CRIJ 5335 and CRIJ 6335.

**CRIJ 6340. Legal Aspects of Criminal Justice Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A consideration of the major legal issues of criminal justice management and the effect of constitutional provisions, statutes, ordinances, and judicial decisions in justice administrations. A discussion of the legal aspects of selection, promotion, assignment, and termination of justice employees. Emphasis is on the possible liabilities of managers and agencies for failure to adhere to legal requirements. Credit will not be awarded for both CRIJ 5340 and CRIJ 6340.

**CRIJ 6342. Crime and Public Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the process by which criminal justice policies are implemented at the local, state, and federal levels. Attention will be given to the impact of public opinion, the media, and politics on policy creation and the challenge of developing effective crime control policies.

**CRIJ 6349. Transnational Trafficking. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine transnational trafficking issues such as human trafficking, drug trafficking, illegal arms trafficking, and other trafficking of illicit substances. The course will explore: key theories, domestic and international policy, enforcement strategies and the role of non-governmental organizations. Students may not receive credit for both CRIJ 5349 and CRIJ 6349.

**CRIJ 6350. Comparative Criminal Justice Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course surveys the criminal justice system and its institutions comparatively across the world to give students a global perspective of the similarities and differences of different criminal justice systems.

**CRIJ 6351. Terrorism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the origins, nature, and operational characteristics of terrorist groups. Students are exposed to topics ranging from the definition of "terrorism" to the unique characteristics of terrorist cells in the United States and abroad. Particular emphasis is on historical and contemporary terrorist attacks against the United States. Students may not receive credit for both CRIJ 5351 and CRIJ 6351.

**CRIJ 6352. Homeland Security. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines principles and practices associated with the emerging discipline of homeland security, including key policies, directives, national plans, and legislation that shape and homeland security. Students may not receive credit for both CRIJ 5352 and CRIJ 6352.

**CRIJ 6353. Global Cyber-Security. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course presents a conceptual overview of information security and its impact on the global stage. Topics include: current trends and over all landscape in information warfare, cybercrime techniques, cyber-terrorism, and information security fundamentals. Included is an emphasis on policy implications for law enforcement at the national level. Student will not be awarded credit for both CRIJ 5353 and CRIJ 6353.

**CRIJ 6354. Introduction to Digital Forensics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the study of digital and computer forensic evidence, search and seizure, chain of custody, and digital storage devices. Student cannot receive credit for both CRCJ 5354 and CRCJ 6354.

**CRIJ 6355. Cellular Forensics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of collection and preservation of digital evidence derived from cellular technologies in a laboratory environment. This study will include the use of hardware and software needed to perform cellular and mobile device forensic investigations including MPE+ and associated connectivity kits. Student cannot receive credit for both CRIJ 5355 and CRIJ 6355. Prerequisites: CRIJ 6353 and CRIJ 5354.

**CRIJ 6356. Digital Forensics Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of evidence collection through a laboratory environment. The course presents students with the working knowledge of the collection, preservation, presentation, and reporting of evidence obtained in a digital investigation. The topics also include encryption techniques and common issues with storage mediums. The course will make use of industry standard software including EnCase and FTK. Student cannot receive credit for both CRIJ 5356 and CRIJ 6356. Prerequisites: CRIJ 5353 or CRIJ 6353.

**CRIJ 6360. Evaluation Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the application of criminal justice research methods to develop and/or evaluate or assess a program or policy. Topics include conceptual, methodological, bureaucratic, political, and organization factors in the evaluation process as well as specific program evaluation research techniques.

**CRIJ 6361. Communities and Crime. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Provides students with an overview of issues related to communities and crime. Examines community context, behavior, and functioning, and how communities are implicated in both crime-generating and crime-preventing processes. Familiarizes students with historical and contemporary literature surrounding the communities and crime relationship.

**CRIJ 6362. Current Issues in Law Enforcement. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In-depth analysis of historical, current, and future issues in law enforcement. Emphasis will be placed on the role of police in society, police-citizen relationships, and empirical evaluations of police effectiveness, police behavior, and programs and strategies.

**CRIJ 6363. Forecasting and Data Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an overview of that analytic methods used in forecasting and predictive policing.

**CRIJ 6364. Crime Mapping, Analysis, and Predictive Modeling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the study and application of crime mapping and analysis techniques. Student cannot receive credit for CRIJ 5364 and CRIJ 6364 Prerequisites: CRIJ 5300 or CRIJ 6300 and CRIJ 5301 or CRIJ 6301.

**CRIJ 6365. Intersections of Domestic and Military Policing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the comparative study and analysis of domestic and military policing. Student cannot receive credit for both CRIJ 5365 and CRIJ 6365.

**CRIJ 6366. Crime and Violence Prevention and Intervention. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines crime prevention and intervention as a potential alternative or complement to traditional criminal justice system responses to crime. Students cannot be awarded credit for both CRIJ 5366 and CRIJ 6366. Prerequisite: CRIJ 5301 or CRIJ 6301.

**CRIJ 6370. Legal Aspects of Evidence. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An exploration of the procedural and substantive rules regarding evidence in criminal proceedings. Topics may include the admission and exclusion of evidence, burden of proof, and best evidence rules.

**CRIJ 6371. Forensic Expert Testimony. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course considers the role of criminal justice professions in provide expert testimony in court. Topics covered will include the ethics of testimony, qualifications for testimony, presentation of evidence and opinion, as well as behavioral aspects of testifying.

**CRIJ 6372. Law and Forensic Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An analysis of the intersection of science and the law with an emphasis on the law affecting forensic science in the criminal justice system. Topics may include the role of experts in both criminal and civil law, ethical issues related to forensic evidence, and wrongful convictions.

**CRIJ 6375. Executive Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the governing principles of organizational leadership within criminal justice and related organizations. Topics will include leadership theory, ethics of leadership, and the role of leadership in garnering public trust. Students may not receive credit for both CRIJ 5375 and CRIJ 6375.

**CRIJ 6380. Proseminar in Criminology and Criminal Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides students with a broad overview of important topics and contemporary issues in criminal justice. This course explores the history and role of criminal justice as an academic discipline and as an institutional system in American society. Particular emphasis is given to acquainting students with the research strengths of the department, individual faculty members' research agendas, and identifying and coordinating potential opportunities for joint research and scholarship among faculty and students.

**CRIJ 6381. Supervised Teaching. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A practicum with the student in teaching, guided by an experienced teacher with whom the student meets from time to time for discussion of readings and classroom experiences. This course is an introduction to basic college level teaching methods. Course content will include methods of instruction, testing and other assessment techniques, use of technology, classroom management, and course development.

**CRIJ 6382. Academic Scholarship and Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides students with the key training needed to engage in the professional activities central to a successful scholarly career in criminology. Emphasis will be placed on preparation of a research project for submission for presentation at a professional conference and submission for publication. Prerequisite: Permission of graduate advisor.

**CRIJ 6390. Independent Study. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specific topic and contents of the course will be determined by the student in consultation with the instructor, with whom the student meets regularly for supervision of the study. May be repeated to a maximum of six semester hours. Prerequisite: Permission of the instructor.

**CRIJ 6391. Preliminary Doctoral Examination. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
During this course the student will prepare and complete the doctoral comprehensive examinations. Prerequisite: Approval of the graduate coordinator with the advice of the graduate faculty.

**CRIJ 6398. Research Methods I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of scientific research methods used in the criminal justice system. Includes a review and critique of research on crime causation, law enforcement, courts, and corrections. Emphasis will be place on quantitative research methods. Credit will not be awarded for both CRIJ 5398 and CRIJ 6398.

**CRIJ 6399. Research Methods II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will familiarize students with the nature and utility of qualitative research methods in various areas of criminological research. Topics may include field work, interviews, and content analysis. Prerequisite: CRIJ 5398 or CRIJ 6398.

**CRIJ 7090. Dissertation. 1-9 Credit Hours (Lecture: 1-9 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thorough and scholarly investigation of a topic acceptable to the dissertation committee. The dissertation must provide evidence that the candidate has pursued a coherent program of research related to the student's area(s) of academic specialization, the results of which reveal academic excellence and which make an original contribution to the discipline. Graded on a satisfactory (S) or unsatisfactory (U) basis. Course may be repeated as necessary, but credit will not be awarded for more than 9 credit hours.Prerequisite: Doctoral Standing and successful completion of the doctoral qualifying examination.

# Counseling

## Courses

**CNSL 2300. Introduction to the Counseling Profession. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide an overview of various components of the counseling profession. Students will explore their personal motivation and interest in a counseling or human services profession as well as integrate professional concepts with personal style. The course will emphasize development of professional identity, therapeutic relationship, counseling theory, application, and ethics. The degree to which you perceive this experience as enhancing your personal and professional growth will largely be a function of your own goals and the initiative you assume in class.

**CNSL 2301. The Basics of Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An integrated overview of counseling services through personal self-exploration by the counseling associate. Focus is on understanding of interpersonal dynamics through self-awareness. Prerequisite: CNSL 2300.

**CNSL 3300. Diversity and Cultural Awareness in the Counseling Profession. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Didactic, experiential and applied learning opportunities prepare students to understand differences and commonalities within diverse cultures. Students learn how cultural identity influences personal and world views, perceptions of experience, and styles of communication. With a focus on developing intrapersonal and interpersonal awareness, students cultivate attitudes and practice skills necessary for relating constructively with diverse individuals in a variety of work settings.

**CNSL 3301. Group Processes in Helping Relationships. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Group dynamics laboratory: Group functions and leadership styles as related to helping relationships.

**CNSL 3302. Survey of Career Development and Career Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an integrated overview of the field of career counseling. Focus will be on current problems and developments in career choices, with emphasis on the role of personal self-exploration in evaluating approaches to career counseling and decision-making.

**CNSL 4300. Essentials of Helping Relationships. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Didactic and experiential training in interpersonal relationships; analysis and application of effective counseling activities.

**CNSL 4301. Introduction to Substance Abuse and Addiction Issues in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides a working knowledge of the helping process as it applies to substance abuse and addiction issues. It focuses on assessment and diagnostic skills; the pharmacology of commonly abused substances; appropriate goals and treatment plans; individual, group, and family treatment approaches; the levels of care available to clients and their families; current research, trends and success rates in treatment; the impact of sex, age, and ethnicity on the treatment process; and the ethical guidelines of practice.

**CNSL 4302. Case Management in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to help students develop a general overview of case management and how it is defined and practiced currently in mental health programs and settings.

**CNSL 5086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Open to graduate students in counseling who are independently capable of developing a problem in the area of counseling and guidance. Problems chosen by the student must be approved in advance by the instructor.

**CNSL 5301. Research Methods in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course emphasizes research in the counseling field, basic statistics, literature review, proposal and report development, research implementation, needs assessment, program development, and ethical and legal considerations regarding research through the presentation of a formal research proposal and/or presentation of a completed research report. In addition the course explores the history and theory underlying program evaluation, approaches to evaluation, and techniques used for program evaluation, students consider the importance of scholarly writing and learn how to identify a topic for research and how to conduct a literature search. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5304. Human Growth and Development in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces studies that provide an understanding of the nature and needs of persons at all developmental levels and in diverse cultural contexts. This course also provides a systematic study of human development emphasizing physical, personality, cognitive, moral and psychosocial developmental theories and issues, with an emphasis on facilitating optimal development and wellness over the lifespan. This course will attempt to merge theory into practice and integrate critical thinking concepts associated with developmental factors in human development. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5311. Cultural, Minority, and Gender Issues for the Counselor. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is the study of interaction of social/cultural groups in America, problems of minorities and ethnic groups, problems related to gender and age, problems within family systems and contemporary sources of positive change. This course provides an understanding of how diverse values and mores, interaction patterns, social conditions, and trends related to cultural and ethnic diversity affect counseling. Emphasis is on developing knowledge, skills, and attitudes for more effective counseling with persons different from the counselor regarding characteristics such as culture, race, gender, sexual orientation, physical disability, and religious preference. Substantial attention is given to developing awareness of one's own values, attitudes, and beliefs as they relate to counseling in a diverse society. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5313. Crisis Interventions and Management for Counselors. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the research and practice of crisis counseling, trauma counseling and disaster mental health. Issues related to the assessment, diagnosis and treatment of clients affected by crises, trauma and disasters will be thoroughly addressed. Prerequisite: CNSL 5350 and CNSL 5350.

**CNSL 5323. Ethical Consultation and Supervision in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide an introduction to counseling services in private practice, community centers and helping agencies, and schools and universities. Students will learn how to open a private practice, be consultants, clinical directors, and administrators. Overview of leadership theory and skills, consultation models and process, program evaluation, methods, and structure, and ethical, legal, and professional issues, the availability of funding sources and community resources. Students develop a personal model of consultation and apply their knowledge and skills to case studies and real-life examples. Prerequisites: CPSY 5350 and CPSY 5353.

**CNSL 5324. Human Sexuality and Sexual Dysfunction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a detailed examination of human sexuality, including reproductive physiology, sexual development across the lifespan, sexual behavior, sexual diversity, and the treatment of sexual dysfunction. The course includes a focus on the role of sexuality in relationships and in marital and family dynamics. Prerequisites: CNSL 5350, CNSL 5353, and CNSL 5356.

**CNSL 5332. Psychopharmacology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The understanding of the basic neurobiology of psychopathology and how psychotropic medications treat such conditions is the foundation of this class. An emphasis is placed on the role of the counselor as a member of a treatment team who helps facilitate client treatment compliance and monitors the efficacy and side effect manifestations of psychotropic treatment, while helping to integrate that treatment with other non-pharmacological modalities. The course will include an overview of psychopharmacological medications, their basic classification, indications, contraindications, and side-effects will be provided. One goal of this course is to introduce the students to the basic terminology and models of pharmacokinetics as they relate to clinical mental health counseling and pharmacological treatment. A tertiary aim of the course will be to discuss the ethical role of the mental health counselor who is a part of the mental health care team in pharmacotherapy. Prerequisites: CNSL 5350, CNSL 5353, and CNSL 5358.

**CNSL 5350. Foundations of Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines theories and concepts with emphasis on counseling skills, as well as historical, philosophical, ethical, legal, multicultural exploration and professional issues. The course provides an overview of counseling services commonly found in a variety of settings. It includes individual and group counseling, assessment, career planning, referral, and consultation. All students are required to take the Sixteen Personality Factor Questionnaire (16PF) and complete an essay based on the results. The essay will be reviewed during First Semester Review. The First Semester Review is a mandatory meeting students in their first semester of course work must attend to determine eligibility for admissions to the Counseling Program. The purpose of this meeting is to discuss performance in terms of professionalism, competency with beginning counseling skills, social and emotional maturity, and integrity and ethical standards. The course is taken concurrently with CNSL 5353 in the first semester of enrollment. For further details, reference the TSU Graduate Counseling Program Handbook. Prerequisite: Taken first semester concurrently with CNSL 5353.

**CNSL 5351. Career Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an in-depth study of career counseling that focuses on occupational, educational, and personal/social issues for general and special populations. The course includes examination of theoretical bases for career counseling and a study of organization and delivery of information through individual and group activities. All ethically related concerns are addressed. Students will be required to purchase occupational and educational information materials. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5352. Seminar in School Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an in-depth study of a comprehensive school counseling and guidance program. The course will address the theoretical foundation, knowledge, and skills to prepare the student to implement a counseling and guidance program in an educational (K-12) setting. As the foundation course for those planning to enter school counseling, this course covers organization, planning, management, and evaluation of comprehensive school counseling programs; appropriate roles and functions of school counselors at various school levels, coordination of professional services; and professional issues such as ethics and associations as they specifically relate to school counseling. This course is required of all students seeking master's degrees with the school counseling focus and of all students seeking school counselor certification in Texas. Prerequisites: CNSL 5350 and CNSL 5353.

**CNSL 5353. Counseling Theories and Applications. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course surveys and investigates counseling theories with an emphasis on how theories influence practice. There is a special emphasis is on applications to various population. The course includes role-plays and other experiential methods. Students will participate in recording a counseling session to be critiqued. All students attend mandatory personal counseling with a community counselor during the course. Related ethical and legal concerns are discussed.of enrollment. Prerequisite: Taken first semester concurrently with CNSL 5350.

**CNSL 5354. Group Procedures for Counselors. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to group therapy and group procedures with an emphasis on developing group counseling skills to work with children, adolescents, adults, and special populations. The course covers various types of groups, an understanding of group dynamics and development, and related ethical and legal concerns. Students will participate in supervised group counseling experiences. Using relevant literature, multimedia resources, and a scholar-practitioner model, students develop an understanding of culturally and contextually relevant group practice, group leaders' roles and responsibilities, the relevance and purpose of group work, and strategies for group utilization to foster social change. Students also participate in a group experience in their class. In addition, leadership styles, techniques, and roles are explored. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5356. Introduction to Family Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an overview of the theoretical concepts and intervention strategies unique to family, systems, and relational therapies. The course includes the study of family dynamics, family development, relationships, and the resolution of family concerns. Ethical and legal considerations are included. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5357. Pre-Practicum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to introduce counseling students to basic interviewing and counseling, to include theories and skills. The students will demonstrate an understanding of ethical behavior. The course includes application of multicultural competencies to case conceptualization. The course includes self-care strategies for the counseling student. The course addresses professional issues relevant to the practice of Clinical Mental Health Counseling. Prerequisites: CNSL 5350, CNSL 5351, CNSL 5353 and CNSL 5354 , CNSL 5381.

**CNSL 5358. Diagnosis and Treatment Planning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an overview of psychopathology that includes the history of abnormal behavior and an in-depth study of the specific diagnostic psychological disorders. Emphasis in the course will be on classification systems currently used in clinical settings and treatment alternatives from a counseling perspective. Prerequisites: CNSL 5350 and CNSL 5353.

**CNSL 5359. Evidence Based Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to provide students with both a knowledge/evidence base for the foundations of counseling and practical skills that will prepare them to see clients in their field work. Evidence is presented that the therapeutic alliance is, across all approaches to therapy, the strongest correlate of successful outcome. Students acquire skills in building a personal bond, providing deep empathy, promoting a collaborative atmosphere in therapy, and empowering clients to solve their own problems. Students are also encouraged to explore their own personal impact in developing a therapeutic alliance. Prerequisite: CNSL 5350, CNSL 5353, and CNSL 5358.

**CNSL 5381. Assessment in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to provide an introduction to the principles, concepts, methods, and applications of assessing human experience and behavior for counseling purposes. Topics included for study in this course include the history and philosophy behind measurement and assessment in counseling, statistical concepts, and common assessment formats for measuring constructs such as personality, pathology, achievement and aptitude, and career interests. The required assignments focus on the themes of assessment critique, administration and interpretation of assessment results, and incorporating assessment results into work with clients and students. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5382. Behavior Management and Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an examination of the major approaches and techniques utilized in behavior counseling and behavior management, including the principles of applied behavioral analysis. The course explores formal treatment planning, application, and evaluation of counseling for the management of specific emotional an mental health disorders. Prerequisite: CNSL 5350, CNSL 5353, and CNSL 5358.

**CNSL 5390. Selected Topics in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different topics each semester with a focus on contemporary issues in counseling. This course may be repeated for credit as the topic changes.

**CNSL 5391. Ethical Foundations of Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an exploration of the ethical principles of counselors and related codes of ethics. The course covers models or ethical decision-making and how to apply to counseling practice. Students will learn about the importance of self-care and application. The course explores the importance of multicultural considerations and implications for social justice. Students will learn ethical obligations to advocate for clients. The course covers ethical standards of professional organizations and credentialing bodies. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5392. Counseling Children and Adolescents. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is intended to provide a comprehensive study of therapeutic approaches and techniques for children and adolescents and is designed to develop students' knowledge and skills in the theory and practice of working with children. It prepares counselors to address the specific needs of children and adolescents, with emphasis on developmental needs, specific therapeutic interventions, and common emotional issues. Group and individual counseling techniques and treatment planning are included. Contemporary issues and interventions addressed include: typical developmental problems, creative interventions, crisis management, exceptional children, parenting skills, multicultural considerations, and ethical concerns. Prerequisites: CNSL 5350, CNSL 5353, and CNSL 5393.

**CNSL 5393. Play Therapy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an overview of the essential elements and principles of play therapy, including history, theories, modalities, techniques, applications, and skills. Further, an experiential component focuses on basic play therapy skill development within the context of ethical and diversity-sensitive practice. The course meets Association for Play Therapy requirements providing 67.5 Continuing Education (CE) hours towards the mandatory 150 required for RPT certification. Prerequisites: CNSL 5350, CNSL 5353, and CNSL 5358.

**CNSL 5394. Behavioral Addictions and Substance Abuse. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is intended to provide students with information regarding behavioral addictions (gambling, sex, Internet, video gaming, etc.), substance abuse, and co-occurring disorders. Information regarding the etiology, recognition, assessment, diagnosis, treatment, and impact of addictions will be addressed. The influence of addictions throughout the lifespan will also be examined. An experiential component is included as well. Ethical and legal concerns are covered. Prerequisite: CNSL 5350 and CNSL 5353.

**CNSL 5395. Internship in Counseling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in guidance and counseling. Major emphasis is placed on the student's involvement in successful practices at the educational level of interest. Students must have met all academic and professional standards of practice before placement. The field experience will consist of a minimum of 150 clock hours. Liability insurance is required. An application must be submitted by the published due date in the semester prior to field placement and approved by the practicum/internship director. Prerequisites: 3.0 or greater GPA and CPSY 5357, or approval of the department head. Field experience fee $75.

**CNSL 5396. Internship in Counseling II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in counseling at a field placement. Students must have met all academic and professional standards of practice before placement. The field experience will consist of a minimum of 160 clock hours. Liability insurance is required. A complete application must be submitted by the published due date in the semester prior to field placement and approved by the director. This course is repeatable up to two times for a maximum number of 6 credit hours. Prerequisites: CNSL 5395 and approval of program director.

**CNSL 5397. Practicum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an overview of the basic counseling skills used by the professional counselor in working with children, adolescents, and adults. The course includes a laboratory experience in which the student is trained in the application of counseling relationship-building and working-stage skills via role-play activities with other students in the class and field placements as available. Integration of theory and practice is imperative in counselor training. This course is repeatable up to two times but a maximum number of 3 credit hours will be awarded. This course will be graded using a pass/fail grading system. Prerequisite: 3.0 GPA or greater and CNSL 5357, CNSL 5358, CNSL 5311, and one elective from CNSL 5382, CNSL 5324, CNSL 5359, CNSL 5393, or CNSL 5392.

**CNSL 5399. Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Primary interest is on integration of process, conceptual, professional, and personal skills. Provides extensive supervised experience in a setting closely aligned with student's chosen program. Taken as a two-semester sequence of two, three credit-hour courses. Each semester requires twenty weekly hours (300 total in each) of field experience. This course is repeatable up to four times, but a maximum of 6 credit hours will be awarded. This course will be graded using a pass/fail grading system. Prerequisite: CNSL 5350, CNSL 5351, CNSL 5353, CNSL 5354, CNSL 5381, grade of "B" or better in CNSL 5357 and CNSL 5397 and departmental permission received via application acceptance.

# Construction

## Courses

**CNST 1305. Construction Graphics. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Computer based 2D & 3D graphics used in the construction industry including CAD/REVIT based drawing development, construction drawing interpretation, site/plan/elevation/section/detail drawings, structural and MEP drawings. Residential and commercial construction based. Lab fee: $10.

**CNST 1306. Construction Materials and Methods. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course introduces students to the basic building materials and systems used in constructing buildings, bridges, and infrastructure projects. It offers the basic Understanding of the use of common systems such as foundations, structural framing/skeleton, building envelops, and finishes. Namely, it introduces students to proper terminology and usage of wood, steel, and concrete materials and selected manufactured components. Lab fee: $10.

**CNST 1307. Construction Methods-Concrete and Masonry. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course is an investigation into concrete and masonry construction methods, testing, and design used an residential and commercial construction is made. Topics include: concrete slab, wall, footing, and pier construction; brick and concrete masonry unit (CMU) wall construction; and decorative concrete /masonry design techniques. Lab fee: $30.

**CNST 2323. Construction Estimating I. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course introduces students to the skills and tools necessary to prepare formal cost estimations for residential construction projects. It focuses on pricing, indirect costs, bid analysis and use of computer aided software. The goal of this course is to expand the student's skills in new topics of estimating and to assist in developing high confidence in the application of construction estimating skills. This course addresses the typical procedures from familiarization with the CSI Divisions, building plans, material quantification, work breakdown, work quantification, pricing and bid submittals while creating detailed cost estimates. Prerequisite: CNST 1306, CNST 1307, CNST 3301.

**CNST 3301. Building Mechanical and Electrical Systems. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course introduces students to the planning and construction of mechanical and electrical systems common to construction projects. It involves basic calculations of cooling/heating loads, determination of temporary power demands, and sizing of pipes, HVAC equipment, and ducts. Lab fee: $30.

**CNST 3302. Construction Estimating II. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course covers quantification and pricing of direct field costs and general condition costs for light commercial and industrial construction projects from contract documents as well as preparation of complete lump sum bid package ready for project execution with emphasis on the use of software in the estimating process. Prerequisite: CNST 2323.

**CNST 3308. Structural Steel and Timber Construction. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course introduces students to the design aspects of temporary structures using steel and timber standard shapes/components. This involves the application of the AISC (American Institute of Steel Construction) Code and also the design of wood framework systems. Prerequisites: CNST 1306. Lab fee: $2.

**CNST 3309. Commercial Construction and Industrial Subsystems. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course introduces students to the terminology and functions of details of mechanical and electrical systems common to process and industrial plant projects. It involves basic calculations of systems, determination of power requirements, and selection of systems. Lab fee: $10.

**CNST 3311. Construction Materials Testing and Inspection. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Construction materials testing and inspection procedures in laboratory and field situations using standard testing equipment, methods, and field inspection techniques per ASTM and ACI standards. Laboratory reports, computer analysis, data collection and simulated field inspections are included. Focus is placed on acceptance testing for construction materials. Prerequisites: CNST 1305. Lab fee: $2.

**CNST 3320. Construction Safety Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to OSHA regulations and industry practices related to creating and maintaining safe construction sites. Students will be eligible to sit for the 10-hour OSHA safety certification exam. Prerequisites: CNST 1306 or concurrent enrollment.

**CNST 3321. Construction Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Construction Management courses including construction operations and key project management skills. Critical path scheduling, duration, logic, resource leveling, and the calculation of costs. Typical contract formats: project planning with emphasis on legal aspects of various types of corporations and structure.

**CNST 3335. Construction Layout and Site Development. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Basic surveying techniques for construction layouts, fundamentals and regulations related to land development. Lab fee: $30.

**CNST 3385. Project Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course explores major problems, tasks and techniques required to manage the technical program in each phase of the product life cycle. Organizational planning, decision-making, and internal external interface techniques for each phase of the project life cycle are addressed. Additional concepts such as: Earned Value Analysis (EVA), Critical Path Management (CPM), Project Requirements Analysis, and Schedule Task Analysis will be explored in depth.

**CNST 4084. Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Topics will vary according to timeliness and special needs. May be taken more than once for credit.

**CNST 4086. Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
This course is designed to meet the needs of Engineering Technology students who have above average academic ability and who need to pursue subject matter that is not normally included in the Engineering Technology curriculum. Approval for enrollment in this course shall be with the concurrence of the individual instructor and the department head. The student must be currently enrolled in one of the majors offered in the Engineering Technology Department.

**CNST 4310. Site & Building Foundations. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
The course gives an overview of the difference and correlation between soil mechanics and foundations engineering. Soil mechanics is the branch of engineering that involves the study of the properties of soils and their behaviors under stress and strain in idealized conditions. Foundation engineering is the application of the principles of soil mechanics in the planning, design and construction of foundations for buildings, highways, dams and so forth. This course presents a detailed look into soil properties and foundations design. Prerequisites: CNST 3335. Lab fee: $2.

**CNST 4313. Construction Law and Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to basic understanding of contractual issues that are significant to construction managers. The course is designed to teach basic concepts of contract law and to recognize legal issues making decisions based on current industrial standards. The course also focuses on addressing ethics in the construction industry.

**CNST 4322. Building Information Modeling. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course is designed specifically to both introduce specific BIM (Building Information Modeling) techniques and software as well as further develop VDC (Virtual Design and Construction) software as they align with current managerial methods and project delivery platforms. The course is also designed and developed to promote discussion with respect to the roles played by owners, designers, builders, and suppliers. Specific attention is paid to BIM's role in various project platform delivery systems including DESIGN-BID-BUILD, DESIGN BUILD, CM AT RISK, and IPD. Prerequisite: CNST 4325, CNST 3385, CNST 3321, Minimum of 90 hours coursework complete Lab fee: $2.

**CNST 4323. Construction Estimating. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course introduces students to the skills and tools necessary to prepare formal bids for construction projects. It focuses on pricing, indirect costs, bid analysis and use of computer aided software. The goal of this course is to expand your skills in new topics of estimating and to assist you in developing high confidence in the application of the estimating skills you learned previously. The course addresses the bidding procedure from receipt of bid documents through work breakdown, work quantification, pricing and bid submittal for lump sum and unit price bids, and preparation of design/build proposals. Prerequisites: CNST 1306, 1307, and 3301 Lab fee: $2.

**CNST 4325. Contract Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to issues regarding administering construction contracts. It focuses on understanding of the purpose of contract documents, legal hierarchy of the documents, the interrelationships among the documents, liabilities accepted with each document, and typical challenges related to communications among the parties involved, establishing chain of commands, warranties, and progress/final payments. Prerequisites: CNST 3321 and CNST 4313.

**CNST 4395. Construction Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Capstone projects course emphasizing a team approach to the analysis and solutions of Construction problems. Projects will be supplied by industry whenever possible. Emphasizes scheduling, design, working in teams. A final written report drawings and presentations will be provided to the customer.

# College of Business Administration

## Courses

**COBA 5100. Foundations of Management. 2 Credit Hours (Lecture: 1.5 Hour, Lab: 0 Hours).**
Framework of the functions and development of management practice. Emphasis on management roles and approaches, applied ethics, and leadership of others in a dynamic, global environment. May be required for admission to Graduate Business Programs. May not be used as credit toward Graduate Business Programs.

**COBA 5101. Foundations of Accounting. 2 Credit Hours (Lecture: 1.5 Hour, Lab: 0 Hours).**
This course presents the foundational principles of accounting to graduate students without a previous foundation. May be required for admission to Graduate Business Programs. May not be used as credit toward Graduate Business Degrees.

**COBA 5102. Foundations of Finance. 2 Credit Hours (Lecture: 1.5 Hour, Lab: 0 Hours).**
Introduction to financial concepts with a corporate finance perspective: calculation and interpretation of financial ratios, time value of money (TVM), valuation of corporate bonds. May be required for admission to Graduate Business Programs. May not be used as credit toward Graduate Business Degrees. Prerequisite: Foundations of Accounting or equivalent and Foundations of Economics or equivalent.

**COBA 5103. Foundations of Statistics. 2 Credit Hours (Lecture: 1.5 Hour, Lab: 0 Hours).**
Introduction to statistics and probability including: Methods of sampling, classifying, analyzing, and presenting numerical data; frequency distribution, averages, dispersion, times series analysis, correlation, and forecasting for business purposes May be required for admission to Graduate Business Programs. May not be used as credit toward Graduate Business Degrees.

**COBA 5104. Foundations of Economics. 2 Credit Hours (Lecture: 1.5 Hour, Lab: 0 Hours).**
An integrated survey of both microeconomics and macroeconomics. May be required for admission to Graduate Business Programs. May not be used as credit toward Graduate Business Degrees.

**COBA 5105. Foundations of Marketing. 2 Credit Hours (Lecture: 1.5 Hour, Lab: 0 Hours).**
This course introduces the principles and concepts of the design, distribution, pricing, and promotion of goods, services, people, places, and causes offered by profit-seeking and non-profit organizations. It also examines both national and international markets and includes an application of the legal and ethical constraints on the marketing field. May be required for admission to Graduate Business Programs. May not be used as credit toward Graduate Business Degrees.

**COBA 5301. Foundations of Accounting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The first component of this course presents the foundational principles of accounting to graduate students without a previous foundation. The second component of this course presents the foundational principles of statistics for graduate students without a previous foundation.

**COBA 5302. Foundations of Economics and Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A foundational course in economics and finance for those students without sufficient preparation. The first component will present the basics of economics. The second component will present the basics of finance.

# Communication

## Courses

**COMM 1100. Transitioning to University Studies in Communication Studies. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare Communication students for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective.

**COMM 1307. Introduction to Mass Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Places mass media in historical perspective; explores the relationships among media; examines the structure of the American communications system and compares it to international communications systems. Analyzes the social, economic, and political implications of modern society's reliance on mass communications. Explores the ways in which the mass media provides images of our world.

**COMM 1311. Introduction to Speech Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to improve the individual's understanding of the human communication process. Classroom exercises involve the student in interpersonal, small group, and presentational speaking situations requiring critical thinking skills, teamwork, and personal responsibility. Special emphasis on developing communication skills needed to check and validate perceptions, control language usage, and analyze and improve reasoning processes.

**COMM 1315. Public Speaking. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the principles and practice of presentational communication. Methods of topic analysis, research, evidence evaluation, organization, and delivery are covered and assignments require critical thinking skills, teamwork, and personal responsibility. Students participate in several classroom presentations.

**COMM 1316. News Photography I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focus on camera operation, film development and printing. Study in the use and layout of photography in newspaper and magazines. Students will learn new photographic technology as well as traditional applications.

**COMM 1342. Voice & Diction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Oral presentation of literary forms with emphasis on the vocal mechanism and phonetics. Interpretative readings in prose, poetry, and drama are directed to help students gain a sensitivity to literary genre and develop effective speech habits through vocal analysis, guided practice, and class drills emphasizing pronunciation, enunciation, and articulation. Credit for both COMS 1342 and DRAM 2336 will not be awarded.

**COMM 2302. Business and Professional Speaking. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of communication in business and professional organizations. Special emphasis will be given to applying thinking skills, teamwork, and personal responsibility to development of speaking skills, interviewing, team-building skills, and a knowledge of organizational communication.

**COMM 2308. Broadcast Production. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will cover on air performance for both radio and TV, audio production, writing for broadcasting and producing radio and television programming. Areas will include radio, TV, podcasting and in studio and remote broadcast.

**COMM 2311. News Gathering & Writing I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamentals of news writing and reporting. Students will learn basic newspaper style and compose stories using traditional stylebook techniques. Students will learn how to write stories for both print, broadcast and online media. Prerequisites: ENGL 1301 and ENGL 1302.

**COMM 2325. Event Coordination. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamentals for professional coordination of special events in various types and styles. Topics focus on event implementation as an essential element of public relations management. Activities center on event logistics, promotions, monitoring, and client liaison.

**COMM 2333. Broadcast Journalism. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A study of broadcast news practices. The basic rules of broadcast news writing will be reviewed and stories will be written and delivered for both radio and television. Studio and newsroom procedures will be examined. Prerequisites: COMM 2311. Lab fee: $5.

**COMM 3303. Debate. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the principles of argumentation and debate. Subject material will include research, evidence, reasoning, case construction, refutation, and delivery. Classroom debating will provide students with opportunities to observe and participate in competitive debating. This course is particularly applicable to those anticipating study in pre-law. Prerequisites: COMM 1311, or 1315, or 2302 or permission of the department head.

**COMM 3304. Interpersonal Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course designed to improve individual communication skills relevant to human relationships. The development and maintenance of interpersonal (one-to-one) relations are examined, with special emphasis on identifying and correcting communication breakdown. A portion of the course will be devoted to exercises designed to improve interpersonal skills. Prerequisite: COMM 1311, or 1315, or 2302 or permission of the department head.

**COMM 3305. Environmental Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to improve students' understanding of the human communication process in shaping perceptions of and relationships with nature and environmental decision making. Prerequisites: COMM 1311,1315 or COMM 2302.

**COMM 3308. Digital Video Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Introduces students to the collaborative process of narrative and non-narrative production while fostering the creation of an individual voice. Students learn the basic techniques and aesthetics of single-camera production, including shot composition, lighting and graphic effects. Students also learn techniques of digital post-production editing. Lab Fee $5.

**COMM 3310. Communication Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines First Amendment case law and state and federal regulations of speech and media. Provides historical and contemporary analyses of the laws of defamation; obscenity; fighting words; and time, place and manner restrictions. Issues such as copyright, privacy, and freedom of information will also be covered. Prerequisite: 3 hours of COMS or approval of department head.

**COMM 3311. Feature Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is a course in our journalism sequence. The class focuses on magazine writing, feature writing, editorial and review writing. The course also focuses on free lance and professional writing and reporting skills. Prerequisites: COMM 2311 or approval of department head.

**COMM 3312. Travel Writing and Blogging. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines writing about travel and tourist destinations for different media. The course examines how traveling writing and blogging is done from different perspectives and examines the ethical and practical issues that guide the process. Prerequisite: COMM 2311.

**COMM 3317. News and Feature Writing I. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course focuses on writing and reporting both hard news and feature stories. There will requirements that students report, write and edit features and news stories with the goal of publication. Prerequisites: COMM 2311. Lab fee: $5.

**COMM 3318. News and Magazine Editing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The basics of story placement and layout, copy and style editing. This course would emphasize the role and responsibilities of different editorial departments as well as the overall responsibility of editorial management. Prerequisites: ENGL 3310 or consent of the instructor.

**COMM 3319. News and Feature Writing II. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course focuses on writing and reporting both hard news and feature stories. There will requirements that students report, write and edit features and news stories with the goal of publication. Prerequisites: COMS 211 or COMM 2311. Lab fee: $5.

**COMM 3320. Public Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the theory, history, and principles of public relations programs for profit and nonprofit organizations, including media relations, crisis management, ethics, social responsibility, and related topics. Critical analysis of public relations is an integral part of the course as is extensive hands-on volunteer work.

**COMM 3321. Advertising. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of advertising in modern society, including history, design and effects of advertising. Students will study the uses of different media for advertising purposes, working in teams to achieve common goals.

**COMM 3323. Political Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of political campaigns in modern society, including history, design and effects of campaigns. Students will study the uses of different media for campaign purposes, working in teams to achieve common goals.

**COMM 3325. Organizational Spokespeople. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of organizational spokespeople in modern society, including history, ghost writing, and effects of their roles and statements. Students will study the uses of different media for spokesperson purposes, working in teams to achieve common goals.

**COMM 3328. Public Relations Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study and practice in the techniques of writing and producing public relations materials with an emphasis on creativity and aligning work to targeted publics. Teamwork and portfolio development are integral learning components of the course. Prerequisites: COMM 2311 and COMM 3320 or permission of instructor.

**COMM 3329. Travel & Tourism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This class covers the way travel and tourism affects the local economy and how Convention & Visitor Bureaus (CVBs) and other local entities "sell" locals and properties to potential customers.

**COMM 3332. Intercultural Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of intercultural communication theories and how they shape interpersonal, small group, and public interactions. Students will observe, participate, and analyze intercultural interactions on campus and in the community.

**COMM 3340. Persuasion. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of persuasive communication theory in interpersonal, small group, and public settings. Emphasis on audience analysis, ethics, motivational factors, source credibility, compliance gaining and theories of attitude change. Prerequisites: COMM 1311, 1315 or 2302.

**COMM 3384. Documentary Film. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine the history of the international documentary film movement from 1923 to the present. Students will examine a variety of different documentary films from different cultures and time periods.

**COMM 4085. Communications Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Content varies according to the needs and desires of the students. When topic varies, course may be taken for credit more than once. Prerequisite: Junior classification or approval of department head.

**COMM 4086. Communication Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
A course featuring independent reading, research, and discussion under personal direction of instructor, topics vary according to student need. Open to students of senior classification with department head approval.

**COMM 4205. Practicum in Journalism. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
Practicum in Journalism requires a demonstrated proficiency in a variety of activities related to writing, reporting, editing and publishing.

**COMM 4301. Media Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will cover business and sales in a comprehensive media environment, as well as issues such as advertising sales, personnel and budget management, and planning and executing of media programming including documentaries.

**COMM 4304. Organizational Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study of communication as it takes place in business and industrial settings. Special attention will be given to managerial communication, communicator style, channels and networks, and organizational communication consulting. Prerequisite: COMM 2302.

**COMM 4309. Advanced Reporting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A capstone course for Journalism students. This course will provide advanced studies for reporting, news writing, newsgathering, interviewing, records evaluation and investigative techniques. Students will be required to submit articles for publication and provide evidence of superior writing skills. Prerequisites: COMM 3310, 3311, and 3318.

**COMM 4310. Computer-Mediated Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course designed to introduce students to key concepts of social networking websites/applications, enable students to interact with others through hands-on experiences on social networking websites/applications, and provide students with experiences to critically analyze the positive and negative aspects of communicating (interpersonal, small group, organizational, etc.) with others through social networking websites/applications.

**COMM 4312. Rhetorical & Communication Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A general survey of classical through contemporary rhetorical and communication theory. Emphasis on how theories have been and are being applied in criticism of public address and rhetorical movements and in contemporary communication research. Prerequisites: COMM 1311, or 1315, or 2302, or permission of the department head.

**COMM 4320. Event Planning and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Application of public relations processes to the planning and management of special events in various types and styles. Topics include theme development, budgeting, creative design, logistics, promotions, monitoring, client liaison, evaluation, and other relevant aspects of event planning and management. Prerequisite: COMM 2325 or permission of the instructor.

**COMM 4325. Applied Public Relations and Event Planning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Hands-on application central to the professional practice of public relations and event planning. Emphasis is on collaboration, critical thinking, problem solving, decision-making, client work, portfolio development, and career preparation. Prerequisites: COMM 3320 and COMM 3328 or permission of the instructor.

**COMM 4339. Group Processes and Decision Making. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of small group theory and processes. Special attention will be given to leadership, organization, group analysis, and interaction. Students will observe and participate in small group discussions on contemporary Prerequisite: COMM 1307, 3304, 3310, and at least 6 hours of senior-level COMM.

**COMM 4384. Communications Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Approved and supervised work experience in communications related positions. May be repeated once for a total of 6 hours of academic credit. Prerequisites: Junior standing, 12 hours COMM, and approval of the department's appropriate concentration coordinator.

**COMM 5086. Special Problems. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Conference course. Directed independent study under supervision of a senior faculty member.

**COMM 5304. Organizational Communication Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an advanced study of communication as it takes place in business, industrial, and non-profit settings. Special attention is given to managerial communication, communicator styles, channels and networks, and organizational communication consulting.

**COMM 5310. New Communication Technology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This graduate course provides a historical foundation focused on new communication technology. This course also incorporates communication theories while focusing on the benefits and disadvantages of new communication technology. Students will also explore the ways these technologies are positively and negatively influenced by national/international: cultures, economies, intellectual capital, and politics.

**COMM 5311. Applied Social Media. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This graduate course is designed to introduce students to key concepts of social networking websites/applications, enable students to interact with others through hands-on experiences on social networking websites/applications, and provide students with experiences to critically analyze the positive and negative aspects of communicating (interpersonal, small group, organizational, etc.) with others through social networking.

**COMM 5312. Computer-Mediated Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This graduate course in provides a historical and futuristic perspective on the creation of the internet and computer-mediated communication. Students in the course will examine and critique scholarly research articles focused on a variety of computer-mediated communication contexts (i.e. - blogs, social networking websites, video chat, etc.).

**COMM 5320. Communication Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This graduate course provides perspectives on communication ethics, from historical underpinnings to theory to professional ethical codes to decision-making structures weighing values, principles and stakeholders. Students in the course will examine and critique ethical factors and decision-making with communication case studies.

**COMM 5321. Survey of Communication Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This graduate course is a study of cornerstone and current communication research. Research articles and projects with varying methodologies will be analyzed for the big-picture perspective on communication scholarship. Students in the course will examine and critique communication research, its context, methodological strengths and weaknesses, and its value and impact on professional communication roles.

**COMM 5323. Small Group Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This advanced course explores the concepts, models, and theories of group interaction and teamwork as it applies to group communication. Special attention is paid to the processes of decision making and problem solving within organizational groups as well examining case studies of group processes and outcomes.

**COMM 5340. Environmental Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the role human communication plays in creating and sustaining relationship with nature.Topics can include: Public Participation, Environmental Conflict, promoting environmental sustainability, etc. Prerequisite: Graduate standing.

**COMM 5352. Communication Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an advanced study of communication theory exploring the concepts, models, and theories of human communication. Prerequisite: Graduate Standing.

**COMM 5385. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Content varies according to the needs and desires of the students. When topic varies, course may be taken for credit more than once. Open to students of graduate classification.

# Computer Science

## Courses

**COSC 1100. Transitioning to University Studies in Computer Science. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of engineering and computer science disciplines.

**COSC 1302. Introduction to Computer Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
History of computers and of their applications in a variety of fields, both as PCs and as embedded systems. Overview of programming paradigms. Overview of today's most dynamic computer-related technologies, including communication networks and the Internet. A modern programming language is used to present types of problems that can be solved with computers, the underlying algorithms, and the fundamental limitations. We adopt early in this course the information-centric viewpoint, exploring the role of computers in all stages of the information life-cycle. Students apply their newly-acquired programming skills to performing basic information-processing tasks. Lab fee $15.

**COSC 1310. Procedural Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduces the fundamental concepts of structured programming. Topics include software development and methodology, data types, control structures, functions, arrays, pointers and the mechanics of running, testing, and debugging. Prerequisite: One of the following: MATH 1314, MATH 1316, MATH 2412, or MATH 2413. Lab fee: $2.

**COSC 2321. C++ Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Applies the object-oriented programming paradigm using the C++ programming language. The focus is on the definition and use of classes, interfaces, data encapsulation, inheritance, and polymorphism, templates and exceptions. Presents an introduction to object-oriented design. Prerequisite: COSC 1310. Lab fee: $2.

**COSC 2331. Java Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The main parts of the Java programming language are covered, including classes, methods, interfaces, inheritance, polymorphism, generics, lambda expressions, annotations, exceptions, threads and synchronization, collections, Java IO and NIO API. Prerequisite: COSC 1310 Lab fee: $2.

**COSC 2341. Data Structures. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Application of programming techniques, introducing the fundamental concepts of data structures and algorithms. Topics include recursion, fundamental data structures (including stacks, queues, linked lists, hash tables, trees, and graphs), and algorithmic analysis. Prerequisite: COSC 1310 or BCIS 3332 or BCIS 3333 Lab fee: $2.

**COSC 2448. Introduction to Digital Systems Design. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Combinational and sequential digital system design techniques; programmable logic devices; computer components (ALU, memory, IO circuits); hardware description language (VHDL); introduction to machine and assembly languages. Credit for both COSC 2448 and ELEN 2448 will not be awarded. Prerequisite: COSC 1310 (coreq) or ENGR 1212 (prereq) Lab fee: $2.

**COSC 3330. Game, Graphics and GUI Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Covers the principles and techniques used to develop GUI-based applications: window creation, dialog boxes, menus and controls. Introduces 2D and 3D graphics. Introduces the main building-blocks of game design, from a programmer's perspective, such as character animation, scene navigation, shading, modeling, game rules. Prerequisite: COSC 2321, COSC 2331, and COSC 2341 Lab fee: $2.

**COSC 3344. Computer Applications in Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Binary representations of integers, floating-point numbers and characters; solutions to specific and general polynomial equations; regression and iteration techniques; approximate derivation and integration; error analysis; linear systems and matrix algorithms; other selected numerical algorithms. Prerequisites: MATH 2414 and one of the following: COSC 1310 or BCIS 3332 or BCIS 3333 Lab fee: $2.

**COSC 3360. Introduction to Data Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Programming tools are used to illustrate the components of the data pipeline: data collection, cleaning, exploration, dimensionality reduction, modeling, visualization, and applications. The course includes an introduction to machine learning. Prerequisite: COSC 1310, or COSC 2321, or COSC 2331, or BCIS 3332, or BCIS 3333 Lab fee: $2.

**COSC 3365. NoSQL Databases. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course provides an introduction to NoSQL database management systems, with emphasis on the document-centric model. Topics include Create, Read, Update, Delete (CRUD) operations, data processing pipelines, replication, sharding, and the MapReduce paradigm. Prerequisite: COSC 1310, or COSC 2321, or COSC 2331, or BCIS 3332, or BCIS 3333 Lab fee: $2.

**COSC 3366. Computer Vision. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course provides an introduction to the field of computer vision. It covers a broad range of topics, from simple to complex, such as: image formation, camera calibration, image processing, edge detection, filtering, feature extraction, image segmentation, multiple-view geometry, optical flow. The course also provides an introduction to deep learning and robotics applications. Prerequisite: COSC 1310 or COSC 2321 or COSC 2331 or BCIS 3332 or BCIS 3333 Lab fee: $2.

**COSC 3380. Operating Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to the design and development of operating systems. Analysis of current system software technology, including process management, memory organization, security, and file systems. Prerequisites: COSC 2331 and COSC 2341Lab fee $2.

**COSC 3390. Software Engineering II. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The course is a follow-up to Software Engineering I. The main topics are: tools used in software development, coding practices, design patterns, code smells and refactoring, and testing. Prerequisite: COSC 3489 Lab fee: $2.

**COSC 3443. Computer Architecture. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Hardware and software structures found in modern digital computers. Instruction set architecture, hardwired design of the processor, assembly language programming, microprogramming, I/O and memory units, analysis of instruction usage, and hardware complexity. Credit for both COSC 3443 and ELEN 3443 will not be awarded. Prerequisite: COSC 2448 or ELEN 2448. Lab fee $15.

**COSC 3489. Software Engineering I. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The course is an introduction to software engineering. The main topics are software development process, software requirements, Unified Modeling Language, conceptual and behavioral modeling, software architecture, software design, and design principles. Prerequisite: COSC 2331 Lab fee: $2.

**COSC 4086. Special Problems. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 1-4 Hours).**
Directed study of selected topics in Computer Science. May be repeated with approval of department head.

**COSC 4360. Machine Learning for Data Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course is a broad introduction to machine learning algorithms, with emphasis on their application in data science. Topics include dimensionality reduction, regression, clustering, support vector machines, decision trees, naïve Bayes, and neural networks. The course includes a significant project component, with real-world data. Prerequisites: COSC 2341, COSC 3360 and MATH 1342 Lab fee: $2.

**COSC 4389. Programming Languages Fundamentals. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The course is about the principles of programming languages, concepts of language processing, program representation, and language translation and execution. The main topics are formal description of programming languages, syntax analysis, semantic analysis, code generation, and runtime systems. Prerequisite: COSC 2331, COSC 2341 Lab fee: $2.

**COSC 4401. Database Theory and Practice. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Fundamental types of database models, with emphasis on relational databases. SQL, conceptual modeling, relational algebra, functional dependency theory, normalization and normal forms. File and data management principles underlying database construction. Optimization algorithms and indexing. Prerequisites: Either COSC 2341 by itself, or (MATH 3310 and one of the following: COSC 1310 or BCIS 3332 or BCIS 3333) Lab fee: $2.

**COSC 4441. Microprocessor System Design. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to microprocessors; 8/16 bit single board computer hardware and software designs; chip select equations for memory board design, serial and parallel I/O interfacing; ROM, static and dynamic RAM circuits for no wait-state design; assembly language programming, stack models, subroutines and I/O processing. Credit for both COSC 4441 and ELEN 4441 will not be awarded. Prerequisite: COSC 1310; ELEN 2448 or COSC 2448. Lab fee $2.

**COSC 4451. Distributed Applications. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the architecture and design of distributed applications. N-tier application and supporting technologies are investigated including client/server architecture, supporting languages, transaction processing, and distribution of processes. Prerequisites: COSC 2331 and COSC 2341. Lab fee $2.

**COSC 4478. Computer Networks. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Bottom-up presentation of computer network hardware and protocols, going through the five main layers: physical, data link, network, transport, and application. Special emphasis is placed on the medium access control sub-layer for local area networks, IP routing, security and modern wireless access technologies. Prerequisites: Either COSC 2341 by itself, or (MATH MATH 3310 and one of the following: COSC 1310 or BCIS 3332 or BCIS 3333) Lab fee: $2.

**COSC 5330. Simulation. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to simulation with emphasis on simulation methodology, random number generation, time flow mechanisms, sampling techniques, and validation and analysis of simulation models and results. Simulation languages and their applications will be investigated. Prerequisites: MATH 1342, COSC 2341, and Graduate standing. Lab fee $15.

**COSC 5360. Artificial Intelligence. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduces representations, algorithms and architectures used to build intelligent systems. Predicate calculus, state-space representation and search, heuristic search, knowledge-based problem-solving, symbol-based and connectionist machine learning, intelligent agents, robotics. Prerequisites: MATH 1342, COSC 2341. Lab fee $15.

# Civil Engineering

## Courses

**CVEN 2200. Surveying. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Introduction to the principles of measurements of distances, angles, and elevations; use of modern surveying equipment, area calculations, effects of observation errors; topographic mapping, traverse and area computations, and triangulation. Prerequisites: ENGR 1212 or concurrent registration; MATH 2413 or concurrent registration. Lab fee: $2.

**CVEN 22325. DO NOT USE. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**

**CVEN 2235. Civil Engineering Graphics. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Introduction to technical drawing applied to civil engineering; design and drawing of various reinforced concrete structure members and connections; use of computer graphic tools, such as AUTOCAD for drawing geometric construction, isometric projection, sectional view, dimensioning, multi-view projections and plans. Prerequisite: CVEN 2312 or concurrent registration, or ENVE 2310 or concurrent registration Lab fee: $2.

**CVEN 2312. Intro to Civil Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the disciplines of civil engineering practice through understanding of various sub-specializations within civil engineering discipline such as geotechnical, structural, transportation, water resources and environmental engineering; sustainable design approaches to civil engineering projects through critical thinking and environmental stewardship; and professional and ethical obligations of civil engineering profession. Prerequisite: ENGR 1212 or concurrent registration.

**CVEN 3301. Structural Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to the basic principles of structural analysis; various methods of analyses for beams, trusses, rigid frames, as well as statically indeterminate beams and trusses; laboratory component includes the modeling of structural deflections, reactions, internal forces of frame and truss structures using software such as RISA-3D, SAP2000 and/or MATLAB. Prerequisites: CVEN 2312 and CVEN 3423 Lab fee: $2.

**CVEN 3320. Construction Planning and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Importance of construction planning and management from awarding contract to completion; construction equipment and management techniques; scheduling, and control techniques in civil engineering; scheduling, progress monitoring, and recovery schedules, and use of tools for schedule optimization. Prerequisites: CVEN 2312 and CVEN 2235.

**CVEN 3325. Contracts and Construction Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Legal aspect of construction industry, ownership, and contractor; contracts and contracting procedure; drawing and specifications used in contract, cost estimation and bidding; contract surety bonds, construction insurance; construction project management and administration; effective project time management; project cost management; prevailing labor market, labor laws, and labor relations; ethics and project safety aspect of construction engineering. Prerequisites: ENGL 1302; CVEN 2310; CVEN 2325.

**CVEN 3423. Strength of Materials. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Application of the theory of strength of materials to engineering design and analysis. Topics include stresses and strains in members subjected to tension, compression, torsion, and shear; flexural and shearing stresses in beams, principal stresses and deflection of beams, column analysis. Prerequisite:ENGR 2321 Lab fee: $2.

**CVEN 3430. Civil Engineering Materials. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introductions to materials engineering; general properties and behavior of construction materials used in civil engineering particularly their mechanical and non-mechanical properties of cement, aggregate, concrete, metals, steel, aluminum, plastics, wood, and composites; environmental influences and construction material behavior; laboratory evaluation of civil engineering material properties through experiments; standard specifications for material properties, techniques for testing. Prerequisites: CVEN 2312 and CHEM 1409 Lab fee: $2.

**CVEN 4086. Special Problems. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 1-4 Hours).**
Directed study of selected topics in Civil Engineering. May be repeated with approval of department head.

**CVEN 4305. Reinforced Concrete Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Flexural analysis and design of reinforced concrete beams including singly and doubly reinforced rectangular beams and T-beams, shear and diagonal tension, serviceability, bond, anchorage and development length, short and slender columns, slabs, footings, and retaining walls, including computer software and a design project. Prerequisite: CVEN 3423.

**CVEN 4306. Steel Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamentals of analysis and design of steel structures; structural elements; simple and eccentric connections; includes a design project. Prerequisite: CVEN 3423.

**CVEN 4325. Foundation Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on geotechnical design of shallow foundations, including spread footings, mats, driven piles, and drilled piers; coverage of bearing capacity, settlement, group effects, lateral load capacity of various foundation types; subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods. Prerequisites: CVEN 2312 and ENVE 2311.

**CVEN 4360. Highway Planning and Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course aims to help students understand the basic principles and techniques in highway planning and design. It includes highway planning process, design of the alignment of intersections, evaluation of earthwork requirements, and safety consideration. Upon completion students should be able to perform basic highway design. The course also covers the topics in highway design in the FE exam. Prerequisite: ENGR 3311.

**CVEN 4450. Transportation Engineering. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Introduction to highway engineering and traffic analysis; geometric design of highways, traffic flow and queuing theory, highway capacity and level of service analysis, traffic control and analysis at intersections, travel demand and traffic forecasting. Prerequisite: CVEN 2312 Lab fee: $2.

# Drama

## Courses

**DRAM 1100. Transitioning to University Studies in Theatre. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of theatre disciplines.

**DRAM 1108. Production Crafts Practicum. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
Construction of scenery in a laboratory situation and through theatrical and television production. May be taken up to 3 times for credit.

**DRAM 1220. Theatre Practicum. 2 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Participation in and analysis of one or more full-length plays, reader's theatre, production, or an evening of interpretation. Must be taken 2 times since course content changes.

**DRAM 1310. Introduction to Theater. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A beginning theatre course providing a survey of the fields of theatre activity. The course provides an introductory knowledge of all phases of drama: literature, Performance, theatre plants, design, costuming, and types of drama. Participation in a college theatre production is encouraged.

**DRAM 1330. Stagecraft I. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The study of technical procedures employed in planning, building, painting, and lighting scenery. Backstage participation in play production as an active set builder and crew member will be required. Stage lighting will be approached from its practical and aesthetic value as a contributing factor to production. Prerequisite: 6 hrs of DRAM/THEA courses or equivalent experience. Lab fee $10.

**DRAM 1341. Makeup. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Design and application of make-up for the stage; areas explored include theory, color, character analysis, materials, old age, three-dimensional, and fantasy make-up.

**DRAM 1351. Acting I. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to the art of acting through basic theory and technique. Participation in college theatre production is encouraged.

**DRAM 1352. Acting II. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
An analytical approach to acting with emphasis on techniques of characterization, stage presence, and movement. Special attention will be given to the role of the actor as an integral member of an ensemble effort. Theories of acting and of acting styles will also be studied. Participation in a college theatre production is encouraged.

**DRAM 2331. Stagecraft II. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The study of theatrical costuming and its application in contemporary theatre. Theory on costuming will be applied in laboratory situations and through theatrical production. Lab fee $10.

**DRAM 2336. Voice for the Theatre. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Oral presentation of literary forms with emphasis on the vocal mechanism and phonetics. Interpretative readings in prose, poetry, and drama are directed to help students gain a sensitivity to literary genre and develop effective speech habits through vocal analysis, guided practice, and class drills emphasizing pronunciation, enunciation, and articulation.

**DRAM 2361. History of the Theatre I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theatre from its origins to 1750; plays, playwrights, actors, costumes, scenic arts of each period as related to events of period and to contemporary theatre.

**DRAM 2362. History of the Theatre II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theatre since 1750; plays, playwrights, actors, costumes, scenic arts of each period as related to events of period and to contemporary theatre. Prerequisite: DRAM 2361 or approval of department head.

**DRAM 3271. Musical Theatre Dance I. 2 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
This course is a dance class as it pertains to musical theatre styles and performance. Specific styles may vary by semester. Participation in college theatre production is encouraged. Prerequisite: N/A Lab fee: $2.

**DRAM 3272. Musical Theatre Dance II. 2 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
This course is the study of dance, movement, and staging for musical theatre. It includes strategies for learning and performing dance combinations as they occur in a professional dance audition. Students will continue to develop fundamental dance technique and apply it to musical theatre dance and culminates in student choreographed/staged works. Lab fee: $2.

**DRAM 3300. Scene Design and Construction. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The study of the elements of a design used to capture mood, atmosphere, and idea of a play; designing to scale, and drawing ground plans and elevations; technical elements of scene construction. Students must work set crew for theatrical production as laboratory.

**DRAM 3301. Costume Design and Construction. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Studies in stage costuming; history, characterization, fabrics, construction and design. A lecture and laboratory course including student planning, illustration, construction, and designing of costumes for University productions. Prerequisite: Technical Theatre II or equivalent experience.

**DRAM 3302. Directing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Basic techniques for the stage including scene interpretation, pictorial composition, movement and rehearsal routine. Students will direct and supervise production of short plays.

**DRAM 3303. Lighting for the Theatre. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
History and techniques of lighting for the stage. Major emphasis is placed on design and practical application. Prerequisite: Technical Theatre I or equivalent experience. Lab fee $10.

**DRAM 3304. Sound for the Theatre. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Techniques of sound for the stage, including multi-track recording, editing, and the study of microphones. Major emphasis is placed on practical application. Prerequisites: DRAM 1330 or equivalent experience. Lab fee $10.

**DRAM 3305. Theatre for Young People. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The history, philosophy, production, and performance of theatre for young people.

**DRAM 3373. Theatre for the Classroom. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theories and practical application of Theatre in the classroom with children and adolescents.

**DRAM 4086. Theatre Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
A course featuring independent study in theatre. Research and discussion under personal direction of an instructor. Topics will vary according to student need. Open to students of senior classification with approval of department head.

**DRAM 4300. Shakespeare. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study in depth of representative types of Shakespeare's dramas and poetry. Credit for both ENGL 4300 and DRAM 4300 will not be awarded. ENGL 4300 and DRAM 4300 are cross-listed courses. Prerequisite: 9 hours of ENGL or approval of department head.

**DRAM 4304. Dramatic Theory & Criticism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the philosophy of aesthetics in theatre and the arts. From the works of various philosophers, directors and actors beginning with Aristotle to contemporary writers.

**DRAM 4307. Theatre Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Theatre management, promotion, finances, organization, emphasis on contract negotiations, planning and use of facilities. A lecture-laboratory course applied to a producing theatre operation and plant. Lab fee $5.

**DRAM 4384. Internship. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
Minimum of 6 weeks of full-time experience with a professional theatre company approved by the department head. (May be repeated once for a total of 6 hours of academic credit.) Prerequisite: Sophomore standing or permission of department head. Field experience fee $50.

**DRAM 4385. Theatre Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
A course open to Theatre students. Topics vary according to student need. May be taken up to three times for credit, for a maximum of 9 hours.

# Economics

## Courses

**ECON 1301. Introduction To Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In this course students are encouraged to use their common sense to understand economic principles and applications. Topics include scarcity, markets, economic goals, government policy, and international trade. This course is designed for students majoring in fields other than business or economics and for students who need a basic review prior to taking ECON 2301 or 2302. Course cannot be counted toward a degree in economics.

**ECON 2301. Principles of Macroeconomics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the aggregate or overall economy. Topics include the description and measurement of economic aggregates; the basic theories of output, employment and prices; the monetary economy and the role of government. Prerequisites: MATH 1314, MATH 1332, MATH 1324, MATH 2412, MATH 2413, MATH 1342, or concurrent enrollment, or approval of department head.

**ECON 2302. Principles of Microeconomics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The major emphasis of this course is on the understanding of markets. Topics include an in-depth study of supply and demand, cost theory, economic resource markets, international trade, and the determination of foreign exchange rates. Prerequisite: MATH 1314, MATH 1332, MATH 1324, MATH 2412, MATH 2413, MATH 1342, or concurrent enrollment, or approval of department head.

**ECON 3301. Intermediate Macroeconomics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course extends the study of the aggregate economy introduced in Economics 2301 with emphasis on theory. Topics include the Classical and Keynesian systems, general equilibrium theories, economic growth, and public policy in a global setting. Prerequisite: ECON 2301.

**ECON 3302. Intermediate Microeconomics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course represents a more advanced study of microeconomic theory than is possible in Economics 2302. Topics include consumer behavior, production and cost theory, market structure, and factor markets. Prerequisite: ECON 2302, or AGEC/AGRI 2317 or equivalent.

**ECON 3303. Money And Banking. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the structure and functions of financial markets and financial intermediaries; the behavior and pattern of interest rates; the basic concepts of commercial bank management; the nature of money and the role of the Federal Reserve in its creation; the basic structure of the economy and the impact of monetary actions on this structure. Prerequisite: ECON 2301.

**ECON 3304. Environmental Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the economics of the natural environment. Economic tools and issues such as social cost, externalities, cost-benefit analysis, property rights, and state and federal environmental policies will be examined with emphasis on problems associated with water pollution, waste disposal, and society's burden of social costs. Prerequisite: 3 hours ECON or AGRI/AGEC 2317.

**ECON 3305. Economics of Financial Markets. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the aggregate financial system and capital markets and the impact these have on financial intermediaries. Topics to be covered are: flow of funds analysis, interest rate theory, role of financial intermediaries, and management of financial assets. Credit for both FINC 3304 and ECON 3305 will not be awarded. Prerequisites: ECON 2301.

**ECON 3306. Political Economy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the historical, philosophical, and theoretical relationships between the state and the economy. Credit for both POLS 3306 and ECON 3306 will not be awarded. Prerequisite: 3 hours of ECON.

**ECON 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a Economics related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of department head.

**ECON 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Independent reading, research and discussion. Entry into this course will be arranged with the Economics counselor. Prerequisites: Approval of department head.

**ECON 4090. Special Topics in Economics. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An examination of current topics in economics. Readings required from current economics publications and other related periodicals. May be repeated for credit when topics vary. Prerequisite: Approval of department head.

**ECON 4301. International Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to international economic theory and policy, the foundations of modern trade theory and its extensions, welfare effects of tariffs and non-tariff barriers, commercial policies of the United States, trade policies of developing countries, multinationals, balance of payments, and foreign exchange markets. Credit for both ECON 4301 and AGEC 4302 will not be awarded. Prerequisite: 3 hours ECON or AGEC/AGRI 2317.

**ECON 4302. Developmental Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to theories of economic development. Much of the course focuses on the sources of economic growth, inequality, and poverty, and what "development" means beyond financial growth. Other topics include population growth, migration, human capital, agriculture, the environment, international trade and finance, and good governance. The twin concepts of market failure and government failure are seen throughout the course Prerequisite: Six hours of economics.

**ECON 4311. Econometrics and Forecasting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Econometrics is the science of using statistics to estimate economic relationships, test economic theories, and evaluate the impacts of government and business policies. Econometrics is also used to forecast or predict how macroeconomics variables, stock prices, and other time-varying economic indicators behave. It is used not only in economics, but in fields as diverse as finance, marketing, political science, sociology, biology, and even comparative literature. Prerequisites: ECON 2301, ECON 2302, and one of the following: BUSI 2311, MATH 3311, AGEC 3317, or MATH 1342.

**ECON 4385. Seminar in Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of selected topics dealing with problems or unique needs of Economics. May be repeated for credit as topics vary. Prerequisite: Approval from department head.

**ECON 5086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 2-6 Hours).**
This course offers students the opportunity to become acquainted with current research being conducted within the student's area of interest; directed reading of a number of sources selected in concert by the student's professor. Prerequisite: Approval of department head.

**ECON 5308. Managerial Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Applies economic theory and methodology to business and administrative decision-making. The tools of economic analysis are demonstrated and their use in formulating business policies is explained. Topics include concepts of profits, production and cost functions, demand theory, competitive pricing policies, and business criteria for investment output and marketing decisions. Prerequisite: Approval of MBA Director.

**ECON 5311. Econometrics and Forecasting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Econometrics is the science of using statistics to estimate economic relationships, test economic theories, and evaluate the impacts of government and business policies. Econometrics is also used to forecast or predict how macroeconomics variables, stock prices and other time-varying economic indicators behave. It is used not only in economics, but in fields as diverse as finance marketing, political science, sociology, biology, and even comparative literature. Prerequisites: COBA 5103 and COBA 5104, or equivalent undergraduate preparation.

**ECON 5320. Health Care Economics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Health Care Economics offers an analysis and evaluation of classical and modern economic theory, principles and procedures applicable to the health care delivery system and their implications for public policy. Prerequisites: None - Some background in accounting, economics and finance is helpful.

**ECON 5359. Economic Applications and Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Seminar examination of the application of economic theory in the firm (micro) and in the overall economy (macro); in-depth research and analysis of current economic issues through critical examination of the professional literature and the current environment of business government. Prerequisite: ECON 4365 Intermediate Economics or Micro and Macroeconomics.

**ECON 5364. Seminar On Global Commerce. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on global competitive challenges facing business management teams. Students will evaluate how companies have strategically entered and developed international markets and managed global diversification. Students will learn to analyze international market potential, assess business risks and become familiar with institutions and national policies directing international trade. Prerequisite: ECON 4365 Intermediate Economics or Micro and Macroeconomics.

# Education Administration

## Courses

**EDAD 5086. Special Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Open to graduate students who are capable of developing a problem independently. Problems are chosen by the student and approved in advance by the instructor.

**EDAD 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: completion of all other coursework required for the degree and consent of the major professor or approval of the department head.

**EDAD 5300. Foundations in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
The purpose of EDAD 5300 Foundations of Educational Leadership is to introduce students to: campus-based educational administration and the context in which it currently operates; an initial description of the scope of the process of educational administration; and a review of the fundamental theories related to management, administration, and leadership. Other concepts to be explored in the course include: creating a shared mission and vision, exploring the Texas Principal Standards, identifying frameworks of educational organizations, examining educational policies at the local, state, and national levels, and developing a context for ethical leadership. Prerequisites: Admission to the Educational Administration program and the principal certification program.

**EDAD 5301. Research in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the fundamentals of research emphasizes research terminology, principal research designs, data collection methodology, psychometric qualities of measurement, research ethics, program evaluation, and distinguishing features of quantitative and qualitative research paradigms. The course focuses on the development and use of the research and evaluation skills necessary to become critical consumers and producers of research.

**EDAD 5307. Leadership of Programs and Procedures in Supervision. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of programs and procedures in supervision emphasizes the application of appropriate supervisory practices in hiring, selection, and retention of teachers, as well as, the development and appraisal of teachers. Educational leaders develop an understanding of clinical and developmental supervision, teacher evaluation/appraisal, observation and feedback, and the evolving concepts of supervisory practice. Prerequisites: Admission to the principal certification program; Completion of EDAD 5300, 5316, and 5309 or approval of department head.

**EDAD 5309. Legal Issues in School Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of legal issues emphasizes the relevant legal principles that affect the operation, organization, and administration of public schools. This course focuses on the ethical application of constitutional, statutory, administrative, and case law. Prerequisites: Completion of EDAD 5300 and EDAD 5316 or approval of the department head.

**EDAD 5310. Special Education Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Legal framework for special education in the United States; consideration of federal constitutional provisions, federal and state statutes, federal and state judicial decisions and rules and regulations for the various federal and state agencies which affect special education.

**EDAD 5316. Instructional Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
EDAD 5316: Instructional Leadership The purpose of EDAD 5316 Instructional Leadership is to help aspiring school administrators develop an understanding of the instructional leadership, coaching, and team building skills necessary to become effective campus principals. The course will require students to develop knowledge and skills of facilitating high-quality instructional practices, creating a school mission, vision, and culture to support teacher growth and student achievement, utilizing data-driven decision making, and implementing instructional coaching to support staff development and teacher growth. Prerequisites: Admission to Educational Leadership and Principal Certification Program prerequisite is completion of EDAD 5300 or approval of the department head.

**EDAD 5317. Public School Fin Fiscal Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The principles of school finance, budgeting, and accounting procedures. Prerequisite: Mid-Management Certification or approval of department head.

**EDAD 5318. Adm Law and Personnel Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A comprehensive study of public school law as it relates to contractual and at-will personnel. Emphasis is placed on advertising, interviewing, selecting, and evaluating personnel. Special attention is given to Equal Employment Opportunity guidelines, Federal Right to Privacy Act, employee contracts, and records. Additional attention is given to employee induction and student records. Prerequisite: Mid-Management Certification or approval of department head.

**EDAD 5319. The School Superintendency. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A detailed study of the multiple roles and responsibilities of the chief school administration, including the leadership role with the community, school board, professional staff, and students. Some observations and activities in the public schools and community will be required. Prerequisite: Mid-Management Certification or approval of department head.

**EDAD 5335. Edu Plan and Facility Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of present and future building and equipment needs of public school systems, including operations, maintenance, and planning for new facilities. Field work will be included in this course relating to various phases of planning and designing educational facilities. Prerequisite: Mid-Management Certification or approval of department head.

**EDAD 5336. Instructional Development and School Improvement. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of research and state policy affecting instructional improvement on public school campuses. Special emphasis on results-based accountability systems, including curriculum planning and evaluation, professional development, student assessment, and analyzing student performance data at the campus level.

**EDAD 5339. Processes of Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of EDAD 5339 Processes of Educational Leadership is to assist academic leaders in developing the utilization of communication skills, school culture development and professional learning communities to address campus improvement planning and create collaborative teams that result in long-term academic and social strategic performance improvement. The course will require students to (1) develop a general knowledge and understanding of multiple perspectives (2) create and frame professional learning communities (3) examine data driven instruction and observation feedback tools (4) develop and implement an effective professional development plan, (5) examine the components of a positive student and staff campus culture aligned with the school vision and (6) identify and evaluate integrated planning and decision-making. Prerequisites: Admission to Educational Leadership and Principal Certification Program prerequisite is completion of EDAD 5300 and EDAD 5316 or approval of the department head.

**EDAD 5340. School-Community Relationships. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Systems of interpretation of schools to community publics. Promotion of effective school-community relations through media of communication.

**EDAD 5342. Leaderships of Campus Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of EDAD 5342 Leadership of Campus Resources is to develop the aspiring campus administrator's knowledge and skills in resource management, policy implementation, personal management, and school operations. Topics will include management of the fiscal resources, physical plant, campus budget, federal programs, and human capital (hiring, selection, and retention) within the framework of strategic planning. Prerequisites: Admission to Educational Leadership and Principal Certification Program and completion of EDAD 5300, EDAD 5316, EDAD 5309, and EDAD 5307 or approval of the department head.

**EDAD 5345. Leadership of Curriculum Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of EDAD 5345 Leadership of Curriculum Systems is to introduce the aspiring campus administrator to the processes supporting curriculum development, implementation, and evaluation. Emphasis will be placed high-quality instruction, curriculum alignment, teacher effectiveness, quality professional development, coaching, and ongoing supervision, Topics include: content area best practices, curriculum alignment, curriculum evaluation, assessment, instructional support, resource allocation, staff development, and personnel management. Prerequisites: Admission to Educational Leadership and Principal Certification Program and completion of EDAD 5300, EDAD 5316, EDAD 5309, and EDAD 5307 or approval of the department head.

**EDAD 5355. Leadership of Diverse Learning Communities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of EDAD 5355 is to assist aspiring administrators in developing a campus culture that promotes awareness and appreciation of diversity, and advocates for all children by promoting continuous and appropriate development of all learners in the campus community. The course focuses on developing administrators who demonstrate ethical leadership by ensuring student access to effective educators, programs and services and by addressing barriers to ensure achievement of campus initiatives and goals. Prerequisites: Admission to Educational Leadership and Principal Certification Program and completion of EDAD 5300 and EDAD 5316 or approval of the department head.

**EDAD 5386. Special Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Open to graduate students who are capable of developing a problem independently. Problems are chosen by the student and approved in advance by the instructor. Prerequisite: Full admission into the College of Graduate Studies and a graduate degree or certification program.

**EDAD 5390. Selected Topics in Educational Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different topics each semester with a focus on contemporary issues in Educational Administration and leadership. This course may be repeated for credit as the topic changes.

**EDAD 5397. Internship for the Superintendent. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).**
Supervised professional activities in the area of the public school superintendency. Intern will be required to demonstrate competencies in the performance of appropriate professional duties as culminating experiences in the Superintendency Program. Prerequisite: Completion of the professional courses in the Superintendency Preparation program or approval of department head. Field experience fee $50.

**EDAD 5398. Principal Practicum I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of EDAD 5398 Principal Practicum is to provide supervised professional activities in the area of educational administration, including the role of elementary and secondary principal and central office administration. The university field supervisor will support principal candidates' development and demonstration of competencies of professional responsibilities according to state standards. As the culminating experience in the Principal Certification Program, students must take Principal Practicum II in the last semester in the program. Prior to enrollment students must have successfully completed Principal Practicum I. Prior to enrolling in Principal Practicum I, all students must submit the Request to Enroll in EDAD 5399 Principal Practicum form, which can be found on the Educational Leadership & Technology (EDLT) web page or requested from the EDLT office. Note: Principal candidates will also need to pass the state principal certification assessment in order to apply for the Principal Standard Certification. Additionally, practicum students must be employed in an educational setting during the entirety of the course. Lastly, the site supervisor who will be mentoring the principal candidate is required to hold current Texas principal certification. This is a two semester course: Principal Practicum I and Principal Practicum II; it must be taken in the fall and spring semesters consecutively. Prerequisites: Admission to Educational Leadership and Principal Certification Program and Completion of Application for Practicum I and completion of EDAD 5300, EDAD 5316, EDAD 5307, EDAD 5309 and EDAD 5399 or approval of the department head.

**EDAD 5399. Principal Practicum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of EDAD 5399 Principal Practicum II is to provide supervised professional activities in the area of educational administration, including the role of elementary and secondary principal and central office administration. The university field supervisor will support principal candidates' development and demonstration of competencies of professional responsibilities according to state standards. As the culminating experience in the Principal Certification Program, students must take Principal Practicum I in the last two semesters in the program. Prior to enrollment all students must submit the Request to Enroll in EDAD 5399 Principal Practicum form, which can be found on the Educational Leadership & Technology (EDLT) web page or requested from the EDLT office. Note: Principal candidates will also need to pass the state principal certification assessment in order to apply for the Principal Standard Certification. Additionally, practicum students must be employed in an educational setting during the entirety of the course. Lastly, the site supervisor who will be mentoring the principal candidate is required to hold current Texas principal certification. This is a two semester course: Principal Practicum I and Principal Practicum II; it must be taken in the fall and spring semesters consecutively.

**EDAD 6111. Critical issues in Educational Leadership. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course is to provide an opportunity to study a current and identified administrative problem in a specific school district or combination of districts. Topics include, but are not limited to, future studies, brain-based learning, and strategic visioning and planning. With departmental approval this course may be repeated when the problems or topics differ. Must be taken three times concurrently with residency. Prerequisites: Doctoral Standing.

**EDAD 6310. Scholar-Practitioner Leader. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This foundation course explores the role of an educational leader as a scholar-practitioner. Scholar-practitioners use empirical evidence and practitioner expertise to inform effective strategies to improve academic environments within broader educational contexts. Prerequisite: Doctoral Standing.

**EDAD 6311. Scholarly Process in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The Scholarly Process in Educational Leadership course is designed to help prepare students to critically examine scholarly articles and other written works in the field of educational leadership and write effective papers for publication or presentation. Students address issues of academic and professional style. Topics may include effective writing techniques and strategies, writing to specific audiences, editing, proofreading, APA style, plagiarism, and academic honesty. Prerequisites: Doctoral Standing.

**EDAD 6312. Research Design and Critical Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course explores mixed methods research designs. Topics include evaluating the quality of empirical research, research design, sampling, data collection, ethical issues, and Institutional Review Board developments. Prerequisites: Doctoral Standing.

**EDAD 6313. Statistical Methods in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to descriptive statistics with an emphasis on inferential statistics. Includes correlation, one way and two way analysis of variance, and experimental design. Requires the use of a hand held calculator, computer, the Statistical Package for the Social Sciences (SPSS), and other statistical software. Prerequisite: EDAD 6312 C or better.

**EDAD 6314. Philosophy and Ethics in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course applies the concepts of ethics and philosophy to personal and professional decision-making relative to educational organizations, operations, and leadership. Prerequisites: Doctoral Standing.

**EDAD 6316. Investigating Problems of Practice in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students identify and systematically investigate problems of practice in educational contexts. Prerequisites: Doctoral Standing.

**EDAD 6317. Educational Equity and Identity. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course identifies equity, diversity, social justice, and oppression issues embedded in complex educational problems of practice. Students evaluate models and theories of change to address issues of equity, diversity, social justice, and oppression in educational environments. Prerequisites: Doctoral standing.

**EDAD 6320. State and Federal Administrative Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the legal and practical foundations of the modern administrative legal oversight in education. Topics include rationales for delegating laws to administrative agencies; the legal framework that governs agency decision-making; the proper role of agencies in interpreting statutory and regulatory law; and judicial review of agency action as applied to educational environments. Prerequisites: Doctoral Standing.

**EDAD 6321. Education Law and Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A thorough investigation of policy making processes and the interrelationship between legal and policy making processes at the national, state, and local levels. An in-depth examination of legal principles and laws affecting the administration and management of educational organizations. Prerequisite: Doctoral Standing.

**EDAD 6322. Data Analysis and School Improvement. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Emphasis on the fundamentals of inferential data analysis with computer applications, which will enhance abilities in the classroom and in administrative responsibilities. This course will provide information, guidance, and models that will enable professional educators to develop effective evaluation and appraisal systems appropriate to their needs. Interpretation and application of assessment procedures and statistical concepts are emphasized in order for educators to facilitate decision-making and disseminate test results and educational evaluations to the community. Prerequisite: Doctoral Standing.

**EDAD 6323. Organizational Theory and Change in Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the identification and application of organizational theories and behavior to the problems of practice in a variety of educational settings. Prerequisites: Doctoral Standing.

**EDAD 6324. Models and Theories of Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide an exploration of key models and theories of educational leadership and examine the impact of each in diverse educational settings. Prerequisites: Doctoral Standing.

**EDAD 6325. Data Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students develop knowledge and skills in mixed methods data analysis techniques. Students select and apply appropriate data analysis techniques to address a variety of research questions. Prerequisites: Doctoral Standing and Successful Completion of EDAD 6311, EDAD 6312, and EDAD 6316.

**EDAD 6330. Educational Policy and Governance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course explores the legislative policy-making process and how it influences educational governance. It also examines the role of agencies and their relationships to educational administration. Prerequisites: Doctoral Standing.

**EDAD 6331. Advanced Data Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Techniques address the approach to data analyses required to examine the problem of practice. Various types of approaches to analyses applicable to the student's selected research topic will be practiced. Prerequisites: Doctoral Standing Successful Completion of: EDAD 6311: Scholarly Process EDAD 6312: Research Design and Critical Analysis EDAD 6316: Investigating Problems of Practice in Educational Leadership EDAD 6325: Data Analysis.

**EDAD 6335. Qualitative Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to qualitative research designs and their philosophical assumptions, and how these influence the research questions, data collection, data analysis, verification, and use of theory and literature. Students will be introduced to five approaches within the qualitative framework: narrative, case study, ethnography, grounded theory, and phenomenology. The course will also address ethical issues in qualitative research and strategies for reporting qualitative data. Prerequisite: Admission to the ELPS Doctoral Program.

**EDAD 6340. Foundations of Higher Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of Foundations of Higher Education emphasizes the origins and specialized purposes of colleges and universities. The organizational structure, governance and administrative functions of higher education are reviewed, compared, and critiqued. With its roots embedded in religion and, more recently in the European university model, American higher education institutions will be studied from an historical perspective. The course will also cover selected contemporary issues facing today's universities, both public and private, with a link to historical, sociological and theoretical underpinnings.

**EDAD 6341. Administrative Leadership in Higher Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of Administrative Leadership in Higher Education emphasizes a thorough investigation of higher education administration theory applied to the practice of performing academic duties combined with an in-depth examination of organizational influences that form the academic, political, legal, governmental, financial, and local framework involved in the administration and management of educational organizations.

**EDAD 6342. Fin and Resource Management in Higher Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of Finance and Resource Management in Higher Education emphasizes higher education's resource acquisition, allocation and management practices. A comprehensive examination is made of the financing of higher education with significant attention given to resource acquisition, allocation, budgeting processes, and reporting standards. Business management functions in higher education such as audits, salary administration, risk management, campus security, informational resources, and human resources are discussed and analyzed.

**EDAD 6343. Teaching and Assessment in Higher Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of Teaching and Assessment in Higher Education emphasizes the exploration of basic organization, structure, development and delivery of college curriculums. The process of teaching and learning through the development and evaluation of student learning and instructional outcomes is investigated. The relationship between the curriculum and basic model of teaching, research and service are introduced with a culminating review of the academic accreditation and institutional benchmarking process and procedures.

**EDAD 6344. Student Service in Higher Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of Student Services in Higher Education emphasizes the exploration of basic organization, structure, and delivery of campus support services for students in higher education. Student populations in colleges and universities will be explored. Student campus life will be studied including but not limited to such topics as housing, student rights, student governance, student health services, food services, campus safety and security, student organizations, and student programming.

**EDAD 6345. Comparative Higher Education Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of Comparative Higher Education Systems emphasizes post-secondary educational systems, structures, and organizational issues in tertiary educational systems outside the United States. The course will address topics such as internal and external governance of post-secondary institutions, access to higher education, student affairs, academic personnel, curriculum, instruction, and educational reform in higher education systems in selected countries. Prerequisite: Doctoral standing or approval of department head.

**EDAD 6347. Trends and Issues in Higher Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of Trends & Issues in Higher Education emphasizes the critical examination of emerging and timely topics and trends that are important to the operation and development of higher education. Using a variety of survey research methods and literature reviews, new and current environmental challenges encountered by institutions of higher education are investigated. Strategies of how to identify and monitor trends and issues are studied. The impact and interaction of external and internal trends and issues on higher education are examined.

**EDAD 6351. Accountability in Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides students an opportunity to make personal and professional decisions relative to academic and fiscal accountability systems. These decisions impact school organization, operation, and leadership in an academic, fiscal, and cultural sense.

**EDAD 6352. Human Resource Administration for Educational Leaders. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on essential human resource skills and knowledge that educational leaders use to implement strategies and policies related to staff management. Prerequisites: Doctoral Standing.

**EDAD 6353. Constituent Relations In Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to examine strategic public relations planning, research, and evaluation techniques for educational leaders. The course connects theory to practical applications in the context of planning, implementation, and evaluation of effective communication with community constituents.

**EDAD 6354. Finance for School Leaders. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Public educational funding is examined as a requirement of school leaders in compliance with federal, state, and local school laws and policies. Educational finance is examined according to various finance theories and models, such as political, legal, economic, and social issues. Prerequisites: Doctoral standing.

**EDAD 6380. Superintendent Leadership and Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to give students a comprehensive view of communication while leading a learning organization at the district level. Emphasis will be placed on the scope and importance of effective communication in education, and the role of communication in establishing favorable workplace outcomes. This course offers an opportunity to learn and apply practical principles of interpersonal communication. The course will examine basic communication concepts, theories, and practices relevant to transferring meaning between two or more people. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head.

**EDAD 6381. Superintendent Leadership and Human Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to assist with the recruitment, hiring, dismissal, and supervision of Texas public school employees. State laws regarding hiring and dismissal will be covered A comprehensive study of public school law as well as performance management and interpersonal conflict of employees as it relates to contractual and at-will personnel. Emphasis is placed on advertising, interviewing, selecting, and evaluating personnel. Special attention is given to Equal Employment Opportunity guidelines, Federal Right to Privacy Act, employee contracts, and records.Additional attention is given to employee induction and student record. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head.

**EDAD 6382. Superintendent Leadership and Resource Allocation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course requires participants to describe and synthesize federal, state, and local revenues as they relate to school district budgeting and finance through empirically based research and direct resources based upon needs assessment from the district improvement plan (DIP) to support goals and objectives identified from the DIP. A detailed study of the multiple roles and responsibilities of the chief school administration, including the leadership role with the community, school board, professional staff, and students. Some observations and activities in the public schools and community will be required. A field experience will be required as part of the course. Prerequisite: Principal or Mid-management certification or approval of department head.

**EDAD 6383. Superintendent Leadership and Accountability. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to assist educational leaders in developing and applying leadership accountability skills in public school organizations. The focus of this course is on the appropriate use of leadership accountability skills within the framework of theory and research to enhance the organizational effectiveness and improve organizational culture. Emphasis is placed on the identification and use of accountability skills supported by the Texas Education Agency as an integral part of Texas superintendent certification preparation program. Accountability leadership is one of the essential administrative functions for the operation of effective learning organizations. In this course, students will have the opportunity to view the accountability process as it pertains to improving student performance. A study of research and state policy affecting instructional improvement in public school systems.Special emphasis on result-based accountability systems, including curriculum planning and evaluation, professional development, and student assessment processes.A field experience will be required as part of the course.

**EDAD 6384. Superintendent Leadership Practicum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course involves superintendent certification program students participating in supervised professional activities in the area of district-level public school superintendent and central office administrator practices. The practicum is required to demonstrate competence in the performance of appropriate professional duties while in a district-level leadership position. No more than 3 semester hours of internship course work can be used to satisfy certification plan requirements.

**EDAD 6385. Advanced Seminar in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Design of research and inquiry in various areas of educational administration; application of models and research procedures from the social and managerial sciences to policy issues in educational organizations. Prerequisite: EDAD 6331 C or better.

**EDAD 6386. Problems in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Open to doctoral students who wish to collaboratively develop a problem with a doctoral faculty member. Culminating project will be disseminated as a presentation, publication, or in another appropriate scholarly venue/format as determined by the doctoral faculty member. Prerequisite: Full admission into the doctoral program and approval of advisor.

**EDAD 6390. Selected Topics in Educational Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different topics each semester with a focus on contemporary issues in educational leadership. This course may be repeated for credit as the topic changes. Prerequisite Course(s): Admission to the doctoral program in Educational Leadership.

**EDAD 6399. Extended Internship in Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised activities in a governmental, organizational, or higher education setting. During the extended internship, the student will be required to demonstrate competencies appropriate to the professional setting of the internship. Prerequisite: Doctoral Standing. Field experience fee $50.

**EDAD 7088. Dissertation. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thorough and scholarly investigation of a topic acceptable to the dissertation committee. To be acceptable, the dissertation must give evidence that the candidate has pursued a program of research, the results of which reveal superior academic competence and a significant contribution to the field. Graded on a satisfactory (S) or unsatisfactory (U) basis. Prerequisite: Doctoral Standing and successful completion of the doctoral qualifying examination.

# Special Education

## Courses

**EDSP 2301. Introduction to Special Populations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The characteristics of exceptional learners and the educational programs for individuals with special needs will be introduced. Additional course content will include the legislation and court cases related to special education and the referral, diagnosis, and placement of exceptional learners. Field experience hours are required.

**EDSP 2362. Special Education Rules and Regulations for Teachers. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Laws and litigation that affect the education of students with disabilities are examined. Includes procedures pertinent to teachers providing special education services such as federal and state regulations, IEPs, and the development of basic instructional plans. Prerequisite: EDSP 2301, equivalent course, or approval of department head.

**EDSP 3360. Assessment Principles in Special Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to provide an understanding of formal and informal assessment and evaluation procedures. In addition, it will present how to evaluate k-12 student competencies in order to make instructional decisions. A field-based experience is required. Prerequisite: EDSP 2301 or EDSP 3361.

**EDSP 3361. Survey of Exceptional Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The characteristics of exceptional learners and the educational programs for individuals with disabilities will be surveyed. Additional course content will include the legislation and court cases related to special education and the referral, diagnosis, and placement of exceptional learners. A field experience is required. Prerequisite: TASP/THEA requirement must be met.

**EDSP 4086. Special Education Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course featuring independent research, reading, application and discussion under personal direction of instructor. Topics vary according to student need. Open to students of junior or senior classification who have been admitted to the Teacher Education Program and with approval of the instructor and department head.

**EDSP 4361. Teaching Strategies for Adolescent Students with Learning Disabilities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to be a Survey of exceptional learners and the mandated educational programs for individuals with disabilities in middle and secondary schools. Additional course content will include instructional and communicative strategies that will facilitate appropriate and productive inclusion of middle and secondary age students with diagnosed and undiagnosed disabilities within general education classrooms and other school settings.. A field experience is required. Prerequisites: EDUC 3321 or EDUC 3320 and admission to Teacher Education.

**EDSP 4362. Special Education Rules and Regulations for Teachers. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Laws and litigation that affect the education of students with disabilities are examined. Includes procedures pertinent to teachers providing special education services such as federal and state regulations, IEPs, and the development of basic instructional plans. Field experience required. Prerequisite: EDSP 3361, equivalent course, or approval of department head.

**EDSP 4363. Teaching Learners with Learning Disabilities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Learning disabilities are examined with emphasis on history, definition, causation and characteristics. Content includes teaching methods for language, academic, and social skills as well as effective inclusive practices. Strategies for successful collaboration with parents, guardians, paraprofessionals and general education teachers are studied. Field experience required. Prerequisite: EDSP 2301 or equivalent course.

**EDSP 4364. Teaching Learners with Developmental Disabilities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Etiology and characteristics associated with deficits in development are studied. Effects of developmental disabilities in the areas of language acquisition and physical, social and emotional functioning are examined. Course content includes methods for teaching functional academic skills, communication skills and life management skills, working with parents, paraprofessionals and related service personnel, community based instruction and vocational planning. Field experience required. Prerequisite: EDSP 2301 or EDSP 3361.

**EDSP 4365. Behavior Management for Exceptional Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Information is provided on managing a classroom that includes students with disabilities. Topics include creating positive interpersonal relationships in the classroom, increasing student motivation and learning, minimizing disruptive behavior, behavioral management strategies, curriculum adaptations, crisis management and behavior management theories and strategies. Information will also be provided on the typical characteristics associated with emotional disabilities and identification procedures utilized. Field experience required. Prerequisite: EDSP 2301 or EDSP 3361.

**EDSP 4367. Programming for Young Children with Disabilities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of young children with disabilities aged birth to 6 with an emphasis on the techniques for implementing programs to meet the needs of the child and the family. Early intervention, medical intervention, and public school educational programming for infants, toddlers, and young children who are at risk will be addressed as well as parent involvement models to promote optimum parent-child and parent-professional relationships. Emphasis on recent research related to early childhood special education. Field experience required.

**EDSP 5086. Special Education Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Open to graduate students who are capable of developing a problem independently. Problems are chosen by the student and approved in advance by the instructor and department head. Prerequisite: Full admission to the College of Graduate Studies and a graduate degree or certification program.

**EDSP 5305. Introduction to Exceptional Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of learner characteristics and an examination of instructional techniques that promote academic, personal, and social growth in exceptional learners and an examination of the process and procedures relating to the placement of exceptional learners. Prerequisite: 18 hours of professional education or certification.

**EDSP 5310. Special Education Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to interpret and apply current special education policy and law to practice, and develop the skills to be professional and ethical educational leaders and advocates for students with disabilities. In addition, an exposure to how issues of diversity have shaped federal statutes and regulations concerning assessment and evaluation procedures, due process and mediation, discipline, individual education plans (IEPs), free appropriate education (FAPE), and least restrictive environment (LRE).

**EDSP 5311. Behavior Management in Special Education Environments. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Characteristics of students with emotional disabilities, including the application of behavioral management strategies appropriate for students with emotional and behavioral disabilities. Course content includes: functional assessment of behavior; development of behavior intervention plans; strategies for teaching appropriate behavior; crisis management strategies; integrating behavior management with instructional programs in school, community and home settings. Prerequisite: admission to the alternative teacher certification program at Tarleton.

**EDSP 5313. Advanced Study of Learning Disabilities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of research-based instructional methods appropriate for students with high incidence disabilities, including causation, diagnosis and educational programming. Course content includes methods for teaching students with learning disabilities, mild intellectual disabilities, speech and language impairments, behavior disorders and other high incidence disabilities. Emphasis placed on adaptation, accommodation, and modification strategies as well as collaboration with parents, paraprofessionals, general education teachers, and other educational professionals.

**EDSP 5315. Advanced Study of Development Disabilities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of research-based instructional methods appropriate for students with learning and developmental disabilities, including causation, diagnosis and educational programming. Course content includes methods for teaching students with learning and developmental disabilities; adapting general education classrooms to accommodate the inclusion of students with learning and developmental disabilities; collaboration with parents, paraprofessionals, and general education teachers. Prerequisite: EDSP 5305 or approval of department head.

**EDSP 5320. Assessing Students with Exceptionalities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides knowledge and skills related to various forms of assessment which are designed to identify and support students with exceptional learning and behavioral needs. Students will become familiar with general concepts related to tests and measurement, and gain experience using various forms of formal and informal assessment. Assessment data will be analyzed and used to help formulate various elements of student instructional plans/interventions. Prerequisite: EDSP 5305.

**EDSP 5325. Appraisal of Exceptional Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Standardized assessment of the academic achievement of students referred for or currently receiving special education services including test administration, analysis, and reporting of scores, and program planning. Prerequisite: Admission into Educational Diagnostician program; EDSP 5305 or concurrent enrollment; or approval of department head. Lab fee: $30.

**EDSP 5327. Teaching Students with Severe to Profound Disabilities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Definitions, characteristics, and instructional techniques for students with severe and profound disabilities, including functional assessment, applied behavioral analysis, Individualized Education Program (IEP) goals and objectives, transition and placement issues. Prerequisite: EDSP 5305 or approval of department head.

**EDSP 5328. Case Management for Educational Diagnosticians. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course addresses state and federal laws that affect the diagnosis, placements, and programs for students with disabilities and the diagnostician's role and responsibilities as compliance officers. Enrollment limited to students admitted to the Diagnostician Certification Program or permission of department head. Prerequisites: Admission to the Educational Diagnostician Certification Program, EDSP 5305, PSYC 5381, EDSP 5325 and EDSP 5329.

**EDSP 5329. Assessing Cognitive Abilities of Exceptional Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Standardized assessment of the cognitive and adaptive behavior abilities of exceptional students. Includes test administration, scoring, analysis, and program planning. Prerequisite: Acceptance into Educational Diagnostician program, EDSP 5305, PSY 5381, and EDSP 5325. Lab fee $30.

**EDSP 5397. Internship in Special Education Teaching. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).**
A supervised, field-based experience in a special education classroom. Interns must demonstrate proficiency in applying effective teaching practices and classroom management strategies in a school classroom. Prerequisite: Admission to a teacher certification program at Tarleton; satisfactory performance in the professional develoment courses preceding the internship. May be repeated for credit. Field experience fee: $75.

**EDSP 5399. Practicum for Educational Diagnosticians. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).**
Supervised professional activities for students preparing for certification as an educational diagnostician. Professional activities will include test administration, scoring, analysis, diagnosis, report writing, and program planning. Students will be required to demonstrate competence in the performance of professional duties as an educational diagnostician. This project addresses a practical, real world challenge using the skills and knowledge students have gained throughout their program of study. The completed project will demonstrate critical thinking, research-based best practices, review of scholarly literature, and formal reporting consistent with APA style. A minimum of 300 hours of documented related professional activities will be required. A field experience fee of $50.00 is required for this course. Prerequisites: EDSP 5305, 5325, and 5329 or approval of department head.

# Educational Technology

## Courses

**EDTC 5086. Educational Technology Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Open to graduate students who are capable of developing a problem independently. Problems must be chosen by the student and approved in advance by the instructor and department head. Prerequisite: Full admission to the College of Graduate Studies and a graduate degree or certification program.

**EDTC 5307. Adult Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the theory and research pertaining to adult learners. Topics for study include the characteristics of adult learners, human performance improvement, instructional and assessment strategies that are effective with adults, technology applications for instructional delivery, and program assessment. Students may not count both EDUC 5307 and EDTC 5307 for credit toward a degree.

**EDTC 5338. Principles of Instructional Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an introduction to several models for instructional systems design and thoroughly examines the process of designing effective instruction. In addition to an in-depth study of instructional design theory, the course features an application of the instructional design process in a phased-based project.

**EDTC 5339. Leading Technology Innovation in Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In this course, the tenets of leadership that are necessary to effectively facilitate technology innovation and change within education will be examined. Students will develop and apply appropriate strategies for their own contexts with regard to providing visionary leadership, fostering a culture of innovation in teaching and learning, promoting and guiding professional development programs, and evaluating and refining initiatives for systemic improvement.

**EDTC 5349. Educational Media and Technology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This foundational course provides an examination of the role of technology in school settings and an exploration of available technologies and the applications for instruction. Focus is on web-based applications for communication and collaboration that expand and extend learning environments.

**EDTC 5353. Designing Online Learning Environments. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide an overview of designing and organizing effective online learning environments. Instructional design principles will serve as a guide as students study multiple Learning Management Systems and software used for developing online learning objects, learning modules, and interactive activities. Students will use their knowledge to develop an online course or module with consideration for the planning, implementation, evaluation and revision cycle needed for continuous updating of an online course.

**EDTC 5354. Facilitating Online Learning Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will prepare students to use effective teaching strategies in an online learning environment with an emphasis on communication, interaction, and organization skills necessary to facilitate and lead online learning. Students will develop and apply appropriate strategies for promoting active and collaborative learning, managing workload and administrative issues related to online teaching, and articulating effective pedagogy for online students.

**EDTC 5356. Social Media Use in Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of this course is to familiarize students with the use of social media in education. During the course, students will explore applications of social media use to enhance learning environments, discuss best practices for teaching and learning with social media, and develop a leadership vision for the integration of social media in teaching and learning.

**EDTC 5359. Leading and Learning with Technology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The course focuses on using technology to study K-12 student learning outcomes, assessment, data analysis, and instructional decision making. Mentoring skills necessary for leadership and peer technology support are also explored. An analysis of Statewide TAKS data will be completed and applied to research of current educational problems. Prerequisite: Permission of the instructor. Lab fee $20.

**EDTC 5370. Intern/Service Learning Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A supervised internship in which the student applies knowledge from the course of study related to instructional design, online course development, online course teaching, or instructional technology leadership for a public or private organization. This project addresses a practical, real-world challenge using the skills and knowledge students have gained throughout their program of study. The completed project will demonstrate critical thinking, research-based best practices, review of scholarly literature, and formal reporting consistent with APA style.

**EDTC 6348. Facilitating Instructional Innovation in Higher Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the tenets of facilitating instructional innovation in higher education settings. Students examine models and strategies for the leadership of instructional innovation, including strategies for co-creating a shared vision for teaching, learning, and assessment at the university, providing meaningful and relevant training and professional development options for students and faculty, and providing critical teaching and learning support for faculty and students. Prerequisite: Doctoral standing.

**EDTC 6358. Facilitating Instructional Innovation in EC-12 Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on facilitating instructional innovation in EC-12 education settings. Students examine models and strategies for the creation of a digital-age learning culture. This includes strategies for co-creating and maintaining a shared vision for teaching, learning, and assessment. It also provides meaningful and relevant professional development opportunities for students, teachers, and parents as well as teaching and learning support for students, teachers, and parents. Prerequisites: Doctoral standing.

**EDTC 6359. Leading Technology Innovation in Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the tenets of leadership necessary to facilitate technology innovation and change within education. Students develop and apply strategies to provide leadership, foster a culture of innovation in teaching and learning, promote and guide professional development programs, and evaluate and refine initiatives for systemic improvement. Prerequisites: Doctoral standing.

# Education

## Courses

**EDUC 1100. Transitioning to University Studies and the Teaching Profession. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. Includes an introduction to and analysis of the culture of schooling and classrooms. Students will examine teaching as a profession through directed experiences. Lab fee: $10.

**EDUC 1301. Introduction to the Teaching Profession. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An introduction and analysis of the culture of schooling and classrooms. Students will examine teaching as a profession through directed experiences.

**EDUC 2300. Families, School, and Community. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of the child, family, community, and schools, including parent education and involvement, family and community lifestyles, child abuse, and current family life issues. The course includes a service learning component to meet the field experiences requirement. Lab fee: $2.

**EDUC 2330. Diversity and Culturally Responsive Teaching for the Early Grades. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course offers an introduction to the issues of diversity (e.g. gender, race/ethnicity, culture, class, language, exceptionality) that impact decisions that early educators must make regarding the design and implementation of curriculum, teaching strategies, materials, and communication. This course also offers an examination of different world views to prepare future teachers in the early grades to provide culturally responsive educational opportunities to children of all cultural and economic groups.

**EDUC 3304. Early Childhood Curriculum, Instruction and Environments. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed as a study of all aspects of the early childhood classroom, including developmentally appropriate practices, curriculum, instruction, assessment, classroom management, and the physical environment. Current issues related to early childhood education will be examined. Students will be expected to demonstrate developmentally appropriate effective teaching practices in field-based setting. Prerequisite: Concurrent enrollment in READ 3321.

**EDUC 3310. Foundations of Bilingual and English as a Second Language Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the history, philosophies, theoretical, and legal foundations regarding Bilingual/English as a Second Language. The course also includes a review of program designs. Recommended concurrent enrollment in EDUC 4315 or 4330. Prerequisite: Admission to the Teacher Education Program.

**EDUC 3315. Literacy Instruction for Bilingual Classrooms. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the knowledge and skills required to teach limited English language learners, with an emphasis on program implementation, curriculum, materials, oral language development, literacy development and assessment strategies. Course will be delivered in Spanish and English. Prerequisite: Proficiency in Spanish and EDUC 3310, 3320, and READ 3311.

**EDUC 3320. Foundations of Teaching: Elementary (EC-6) Classrooms. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of techniques in cooperative learning, brain-based learning and motivation in a learner-centered classroom. Field-based experience requires students to apply course content to the real-world classroom. Prerequisites: CHFS 3300, PSYC 2308, or PSYC 3303 or concurrent enrollment (in any of the 3), and a minimum of 60 hours toward certification or degree requirements. Concurrent enrollment in READ 3321 required for EC-6 students.

**EDUC 3321. Foundations of Teaching: Middle and Secondary Classrooms. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of adolescent students and teachers in middle and secondary schools. Documentation of directed field experiences are required. Prerequisite: Either CHFS 3300, PSYC 2308, or PSYC 3303. Concurrent enrollment in any of the three options is allowed. Student must have 60 earned hours toward degree or certification.

**EDUC 3330. Models of Instruction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the relationships among local, state, and federal standards to develop instruction based on assessment and developmentally appropriate practices. Minimum of 20 hours Field experience component required. Prerequisites: EDUC 3320 or EDUC 3321 and Admission to the Teacher Education Program.

**EDUC 3331. Methodology Field Implementation. 3 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
This course is designed to examine the relationship between the state adopted curriculum and best practices in the classroom, to include practical experience in developing student learning outcomes, designing lesson plans, and delivering and assessing instruction, as well as incorporating effective classroom management techniques into the classroom. Prerequisites: EDUC 3320 or EDUC 3321 and Admission to the Teacher Education Program.

**EDUC 3385. Science Teaching Implementation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will use the Texas Essential Knowledge and Skills (TEKS) as a framework to examine content methodology, skills, and materials necessary to teach science to children in elementary and middle schools. Students will learn how to plan lessons utilizing research-based practices, implement lessons effectively, and reflect on their own science instruction. Course components include hands-on investigations, class discussions, readings, micro-teaching, science notebooks, and field placements with emphasis on developmentally appropriate practices in science instruction. Topics from life science, physical science, earth/space science and nature of science will be covered. Prerequisite: Admission to the Teacher Education Program. Concurrent enrollment in EDUC 3331 or READ 4331.

**EDUC 3394. Curr/Meth EC-Grade Four I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of developmentally appropriate educational strategies and instructional techniques in teaching language arts, social studies, and fine arts to children (preschool - 4th grade). Students will be expected to integrate language arts, social studies, and fine arts within the curriculum as well as evaluate curricula materials. Prerequisites: Junior classification and completion of TASP requirement; READ 3311, SOSC 3301, and FINA 1335.

**EDUC 3395. Social Studies Teaching Implementation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is centered on developing an understanding of historical thinking, and learning new methods to help students examine the purposes, significant issues, and current trends which affect social science and history subject matter EC-6 and 4-8 grades social studies programs. Prerequisite: Admission to the Teacher Education Program. Concurrent enrollment in EDUC 3331 or READ 4331.

**EDUC 3396. Curr/Meth EC-Grade Four II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of developmentally appropriate educational strategies and instructional techniques in teaching mathematics and science to children (preschool - 4th grade) within a problem-based learning approach. Special topics include the appropriate use of technology and cooperative grouping and the integration of curriculum within the content areas of mathematics and science. Prerequisites: MATH 3303 and 3305, GEOL 1401, BIOL 2310, admission to the Teacher Education Program.

**EDUC 4086. Education Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course featuring independent research, reading, and discussion under personal direction of instructor, topics vary according to student need. Open to students of junior or senior classification who have been admitted to the Teacher Education Program and with approval of department head.

**EDUC 4304. Early Childhood Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of classroom management, including the physical environment and use of centers, for diverse groups of early elementary students. A lab and documentation of directed field experiences are required. Prerequisites: Admission to the Teacher Education Program and concurrent enrollment in READ 4310, EDUC 3310(or completion), and EDUC 4315.

**EDUC 4305. Content Area Instruction in Bilingual Classrooms. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of curriculum requirements as applicable to bilingual education, language concepts and proficiencies needed for teaching language arts, math, science and social studies in bilingual classrooms. Students will evaluate commercial and research-based programs in order to adapt materials for students with varying degrees of language and literacy proficiency. Field experiences required. Prerequisites: Admission to the Tarleton Teacher Education Program, EDUC 3310, EDUC 3315, READ 3311, and READ 3351 or READ 3356. Proficiency in Spanish.

**EDUC 4315. EC - 8 Curriculum, Assessment, and Instruction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Overview of developmentally appropriate curriculum adhering to state and national standards for grades EC - 8. Prerequisites: Admission to the Tarleton Teacher Education Program and EDUC 3330, and concurrent enrollment in READ 4310 and EDUC 3310 (or completion).

**EDUC 4330. Application of Effective Teaching Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Documented field-based experiences are provided in school settings where students will plan and deliver units of instruction, examine various models of instruction, analyze classroom management strategies, and demonstrate competencies in effective teaching practices. Prerequisites: EDUC 3330 and READ 3351/READ 3356.

**EDUC 4331. Instructional Strategies for Middle and Secondary Classrooms. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to be an examination of the relationships among local, state, and federal standards to develop instructional strategies derived from research-based practices for middle and secondary classrooms. Field experience required. Prerequisites: EDUC 3321 or EDUC 3320 and Admission to the Teacher Education Program.

**EDUC 4335. Issues of Professionalism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students synthesize and validate concepts encountered during clinical teaching. Prerequisites: Admission to Clinical Teaching and concurrent enrollment in EDUC 4690(or equivalent).

**EDUC 4383. Internship for Classroom Teaching. 3 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
This internship includes supervised, field-based activities in public school classrooms. Major emphasis is placed on the development of instructional strategies and professional practicies designed to improve teaching performance. Students are required to conduct a reflective analysis of their teaching performance. May be repeated for credit. Prerequisite: Admission to the Teacher Education Program. Field experience fee $75.

**EDUC 4690. Clinical Teaching. 6 Credit Hours (Lecture: 0 Hours, Lab: 40 Hours).**
Supervised clinical teaching in the public schools at the appropriate level. Students are required to demonstrate proficiency in content, the application of best practices, and classroom management strategies. Prerequisites: Admission to Clinical Teaching and concurrent enrollment in EDUC 4335(or equivalent). Passing scores on required certification exams.

**EDUC 5085. Education Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
Presentation of project proposal, implementation, and conclusions. Must be repeated a minimum of 3 times for 1 hour credit each semester to complete masters project. Student must be continuously enrolled until the graduate project is completed.

**EDUC 5086. Special Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Open to graduate students who are capable of developing a problem independently. Problems chosen by the student and approved in advance by the instructor. Prerequisite: Graduate major in Education.

**EDUC 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: EDUC 5398, 5357, and consent of major professor.

**EDUC 5301. Readings in Professional Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of current issues in the professional development of educators. Topics include models of professional development, impact of professional development on public school student achievement, effective evaluation of professional development, and identification of best practice in writing and evaluating research with an emphasis on literature reviews.

**EDUC 5302. Cultural Diversity in Schools and Communities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of various dimensions of culture related to teaching, learning, and support services in the community. Topics of study will include ethnicity, socio-economic status, language, gender, religion, age, and exceptionality.

**EDUC 5303. Foundations of Curriculum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the philosophical, historical, psychological and social foundations of curriculum. Analysis and interpretation of theoretical research is required. Students must complete this course within the first twelve semester hours of graduate study. TMATE students will enroll in this course immediately following completion of certification requirements.

**EDUC 5304. Human Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Increasing the understanding of human behavior with emphasis on the child, adolescent, and adult learner. An examination of the social and cultural forces in the formation of personality, the self, and roles in group membership.

**EDUC 5307. Adult Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the theory and research pertaining to adult learners. Topics for study include the characteristics of adult learners, human performance improvement, instructional and assessment strategies that are effective with adults, technology applications for instructional delivery, and program assessment. Students may not count both EDUC 5307 and EDTC 5307 for credit toward a degree.

**EDUC 5310. Foundations of Elementary and Middle School Curriculum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the elementary and middle school curricula, including English language arts and reading; mathematics; life, earth and physical science; social sciences; fine arts; health and physical education. Additional topics include the state adopted curriculum, local school instructional programs and national/state assessment programs. Field experience is required. Prerequisites: admission to the College of Graduate Studies; pending admission to the alternative teacher certification program at Tarleton.

**EDUC 5311. Methods of Effective Teaching. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the research on effective teaching practices with an emphasis on direct instruction. Additional topics of study include mastery learning, assessment of learning and use of assessment to guide instruction. Students will apply technology and effective teaching practices to the design and delivery of instruction. Prerequisite: admission to the alternative teacher certification program at Tarleton.

**EDUC 5312. Seminar in Teaching Language Arts and Social Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An integrated approach to teaching Social Studies through the application of the writing process, reading/writing connections, and children's literature. Prerequisite: 18 hours of professional education course work.

**EDUC 5314. Creating and Managing the Learning Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the research on creating and maintaining a positive learning environment. Additional topics for study include: cultural dimensions of classroom management; motivating student achievement; fostering cooperation among students; and reinforcing appropriate behavior. Prerequisite: admission to the alternative teacher certification program at Tarleton.

**EDUC 5315. Content Methodology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to examine specific content methodology derived from research-based instructional practice using the Texas Educator Standards. All TMATE certification content areas will be available in this online course. Prerequisites: EDUC 5311 and EDUC 5314.

**EDUC 5320. Issues in the Education of Children. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The examination of issues related to the education of young children. Course content includes: applying stage development and learning theories to develop instructional strategies and classroom management practices; cultural and individual differences; teaching English language learners and learners with special needs. Prerequisite: admission to the alternative teacher certification program at Tarleton.

**EDUC 5321. Issues in the Education of Adolescents. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The examination of issues related to the education of adolescents. Course content includes: applying stage development and learning theories to develop instructional strategies and classroom management practices; cultural and individual differences; the adolescent subculture and factors that place adolescents at risk; teaching English language learners and learners with special needs. Prerequisite: admission to the alternative teacher certification program at Tarleton.

**EDUC 5322. Teaching Math and Science in the Elementary School. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study of methods and materials for the teaching of math and science. Emphasis will be on helping teachers become more effective in teaching math and science by developing questions, investigations, speculations, and explorations that reflect not only the content of each area of study, but the process involved in learning.

**EDUC 5334. Curriculum for Early Childhood Programs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study will be made of early childhood education curriculum and practices. An examination will be made of current trends in early childhood curriculum with an emphasis on the modifications needed to ensure the success of all young children. Prerequisite: 18 hours of professional educational course work.

**EDUC 5338. Curriculum Design and Implementation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The curriculum selection, design, implementation, and evaluation processes within the classroom and school district settings are examined. Factors that influence the curriculum decision-making process and a review of theories of curriculum development will be researched. Curriculum alignment and curriculum auditing will be major emphases of this course.

**EDUC 5340. Teaching English as a Second Language. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of theory, research, and practice as it relates to English language learners. This course will provide an overview of the various methods and philosophies of English language instruction. The course will focus on the best practices for developing listening, speaking, reading, and writing skills with English language learners.

**EDUC 5341. Language and Literacy Development in Young Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the interrelatedness between language acquisition and literacy development. This course will review the multiple perspectives on developing English language literacy with English language learners that come from bilingual and multilingual homes. The course will focus on best practices for assessing and developing literacy in English Language Learners.

**EDUC 5342. English as a Second Language Content Area Instruction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of best practices for integrating English language instruction with content-based ESL instruction in science, mathematics and social sciences for non-English speaking students. This course will focus on content specific strategies and sheltered English instruction.

**EDUC 5343. Assessments and Accommodations for English Language Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of assessments to determine English Language Learners' linguistic levels, language proficiency, and growth content area learning.

**EDUC 5345. Advanced Instructional Strategies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The derivation of appropriate methods and techniques from basic principles of learning. The development of working skills needed in cooperative planning, selecting, and organizing teaching materials, utilization of the environment, individual and group guidance, and evaluation activities.

**EDUC 5350. Assessment Issues for Educational Leaders. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The examination of assessment as a process with emphasis on assessment of student achievement and on data interpretation for the purpose of improving instruction.

**EDUC 5355. Effective Instructional Programming. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of research-based best instructional and curricular practices and the evaluation and enhancement of instructional and curricular programs related to identified best practices.

**EDUC 5360. The Gifted Learner. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in-depth study of the characteristics and needs of gifted and talented students as they relate to both school and family settings. Different models and programs for gifted education will be studied. Formal and informal identification procedures will be examined in line with federal and state guidelines.

**EDUC 5362. Creativity in the Classroom. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the theories and models of creativity. Emphasis will be given to identifying the creative potential of students in all classrooms. Instructional processes which accommodate the needs of creative learners will be examined and developed. Prerequisite: EDUC 5360.

**EDUC 5364. Curriculum and Materials Development for the Gifted Learner. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A comparison of regular and gifted curricula with a focus on developing an interdisciplinary curriculum for gifted learners. Students will examine and evaluate existing materials and equipment which support instruction for the gifted in both regular and special programs. One focus will be on developing and evaluating teacher constructed materials. Prerequisite: EDUC 5360.

**EDUC 5366. Instructional and Evaluation Methods for the Gifted Learner. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Methods of determining specific learning styles and talents will be learned, with emphasis placed on implementing appropriate instruction for programs. Methods and tools of informal and formal evaluation and assessment will be examined. Prerequisites: EDUC 5360 and 5364.

**EDUC 5369. Practicum in Gifted Education. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).**
Supervises professional activities in gifted and talented programs. Students will be required to demonstrate competence in the process of delivering a synergistic gifted and talented program. Prerequisites: Successful completion of EDUC 5360, 5362, 5364, and 5366. Field experience fee $50.

**EDUC 5390. Selected Topics in Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different topics each semester with a focus on such subjects as the gifted student, the education of culturally disadvantaged, teacher evaluation, or other selected topics concerning the teaching/learning process. This semester may be repeated for credit as topic changes. Prerequisite: Permission of instructor.

**EDUC 5398. Techniques of Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamental concepts and tools of research applied to psychological and educational problems. Rationale of research, analysis of problems, library skills, sampling, appraisal instruments, statistical description and inference, writing the research report, and representative research designs.

**EDUC 5399. Internship in Teaching. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).**
supervised field-based experience in classroom teaching. Interns must demonstrate proficiency in applying effective teaching practices and classroom management strategies in a school classroom. Prerequisite: Admission to a teacher certification program at Tarleton; satisfactory performance in the professional development courses preceding the internship. May be repeated for credit. Field experience fee: $75.

**EDUC 5695. Practicum in Clinical Teaching. 6 Credit Hours (Lecture: 1 Hour, Lab: 18 Hours).**
Supervised practicum in clinical teaching in the public schools at the appropriate level. Students are required to demonstrate proficiency in the application of effective instructional practices and classroom management strategies. Prerequisite: Admission to the TMATE Practicum in Clinical Teaching.

# Electrical Engineering

## Courses

**ELEN 2425. Electrical Circuit Theory. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Resistive circuits: circuit laws, network reduction, nodal analysis, mesh analysis; energy storage elements; sinusoidal steady state; AC energy systems; magnetically coupled circuits; the ideal transformer; resonance; introduction to computer applications in circuit analysis. Prerequisites: PHYS 2426 or concurrent registration; MATH 2414 or concurrent registration. Lab fee $2.

**ELEN 2448. Introduction to Digital System Design. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Combinational and sequential digital system design techniques; design of practical digital systems. Credit for both COSC 2448 and ELEN 2448 will not be awarded. Prerequisite: COSC 1310 (coreq) or ENGR 1212 (prereq) Lab fee: $2.

**ELEN 3310. Power Systems Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the generation, transmission, distribution and utilization of electric power, along with the electrical devices connected to such systems including generators, motors and transformers. Topics include: fundamentals of electric power, basic components of power systems, three-phase systems, transformers, electric machines, AC and DC motors, generators, power generation and distribution, power plants, transmission lines, and renewable energy systems. Prerequisite: ELEN 2425; MATH 3306 or concurrent registration.

**ELEN 3314. Signals and Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Modeling and analysis of electrical and mechanical systems using Laplace transformation methods; transient and steady-state analysis; Fourier series; Fourier transform; elementary feedback. Prerequisites: ELEN 2425, MATH 3306 or concurrent registration.

**ELEN 3320. Engineering Analysis Techniques. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
This course covers the applications and implementation of numerical algorithms commonly encountered in engineering and scientific analyses. Topics may include statistical analysis, analysis of linear and non-linear systems, optimization and linear programming, numerical differentiation and integration, and analysis of differential equations. Use of MATLAB (or other similar computational tools) for performing computational analysis and generating graphical interpretations of the results is also included. Prerequisite: ENGR 1212 or COSC 1310; MATH 2414 Lab fee: $2.

**ELEN 3332. Electromagnetic Field Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides the background necessary to formulate and solve electromagnetic problems relevant to many fields of electrical engineering such as RF and microwave circuits, photonics, wireless networks, computers, bioengineering, and nanoelectronics. Topics include: static electric and magnetic fields; Maxwell's equations in integral and differential forms; wave propagation; reflection and refraction of plane waves; transient and steady-state behavior of waves on transmission lines. Prerequisites: PHYS 2426; MATH 3306 and MATH 3433 or concurrent registrations.

**ELEN 3360. Microwave Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the key concepts related to the analysis and design of microwave systems at the subsystem and component level. Topics include: waveguides and wave propagation on transmission lines, including stripline and microstrip structures; microwave network analysis; impedance matching techniques; analysis and design of microwave resonators; power dividers, couplers, and hybrids; microwave filters; noise and distortion in microwave circuits; an introduction to microwave system implementation. Prerequisites: ELEN 3314, 3445, and either ELEN 3332 or PHYS 3332.

**ELEN 3443. Computer Architecture. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Hardware and software structures found in modern digital computers. Instruction set architecture, hardwired design of the processor, assembly language programming, microprogramming, I/O and memory units, analysis of instruction usage, and hardware complexity. Credit for both COSC 3443 and ELEN 3443 will not be awarded. Prerequisite: COSC 2448 or ELEN 2448. Lab fee $2.

**ELEN 3445. Electronics I. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A first course in microelectronics intended to give students an introduction to the analysis and design of analog and digital integrated circuits. Topics include: semiconductor physics theory and operating principles of the p-n junction, MOS field effect transistor (MOSFET), and bipolar junction transistor (BJT); operational amplifiers; large- and small-signal equivalent circuit models of diodes, MOSFETs, and BJTs; single-transistor amplifier configurations; digital logic circuits. Prerequisite: ELEN 2425; ELEN 3314 or concurrent registration Lab fee: $2.

**ELEN 4086. Special Problems. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 1-4 Hours).**
Directed study of selected topics in Electrical Engineering. May be repeated with approval of department head.

**ELEN 4336. Solid State Physics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the basic principles required to understand the operation of solid-state devices with an emphasis on device physics. Semiconductor fundamentals including crystals and energy bands, charge carriers (electrons and holes), doping, and transport (drift and diffusion); basic concepts of generation-recombination and the P-N junction as capacitors and current rectifier; semiconductor device equations developed from fundamental concepts; P-N junction theory developed and applied to the analysis of devices such as varactors, bipolar transistors, and field-effect transistors. Prerequisites: ELEN 3445 and MATH 3306.

**ELEN 4350. Communication Systems Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the frequency and time domain; modulation; random signal theory; network analysis using nondeterministic signals; basic information theory; noise. Prerequisites: ELEN 3314 and ELEN 2425.

**ELEN 4355. Digital Signal Processing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to discrete-time signal processing and discrete-time systems. Topics include: discrete-time linear systems, difference equations, z-transforms, discrete convolution, stability, discrete-time Fourier transforms, analog-to-digital and digital-to-analog conversion, digital filter design, discrete Fourier transforms and fast Fourier transforms, spectral analysis, and applications of digital signal processing. Prerequisite: ELEN 3314.

**ELEN 4441. Microprocessor System Design. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to microprocessors; 8/16 bit single board computer hardware and software designs; chip select equations for memory board design, serial and parallel I/O interfacing; ROM, static and dynamic RAM circuits for no wait-state design; assembly language programming, stack models, subroutines and I/O processing. Credit for both COSC 4441 and ELEN 4441 will not be awarded. Prerequisite: COSC 1310; ELEN 2448 or COSC 2448. Lab fee: $2.

**ELEN 4443. Linear Control System Design. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Application of state variable and frequency domain techniques to modeling and analysis of single input, single output linear control systems; physical implementation of control systems by integrating sensors, actuators and other control system components; use of software design tools. Prerequisite: ELEN 2425, MATH 3306, and either ELEN 3320 or COSC 3344. Lab fee $2.

**ELEN 4446. Electronics II. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A second course in microelectronics emphasizing the analysis and design of analog integrated circuits. Topics include: MOSFET and BJT fabrication technologies; current mirrors and biasing techniques; amplifier topologies; frequency response of analog integrated circuits; feedback, stability, and amplifier compensation techniques; output stages; noise in integrated circuits; linear integrated circuit applications. Prerequisites: ELEN 3445 and ELEN 3314 Lab fee: $2.

# Educational Leadership in Higher Education

## Courses

**ELHE 5300. Higher Education History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview of the global history of higher education, and of the development of the higher education system in the United States.

**ELHE 5301. Higher Education Student Services. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Identifies best practices in student service areas and student development theory and application.

**ELHE 5302. Higher Education Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Prepares educational leaders to understand and prepare a system-wide budget plan that allocates resources aligned with the system's needs.

**ELHE 5303. The Comprehensive Community College. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Provides an overview of community and technical college education.

**ELHE 5304. Higher Education Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies leadership on university campuses, both from a theoretical perspective and in the actual practice of leadership.

**ELHE 5305. Higher Education Politics and Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines policies within higher education institutions, as well as state and federal policies related to higher education, the elements of the policy-making process, and the strategies for research and policy analysis in higher education.

**ELHE 5399. Practicum in Higher Education Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised activities in higher education setting or field directly related to higher education, such as a post-secondary coordinating board, legislative body related to post-secondary education, or professional higher education association. During the practicum, the student is expected to demonstrate developed/improved competencies appropriate to the professional setting. This course should be completed in the last semester of the course work. It may be taken with up to two other courses identified as prerequisites upon approval of department head. Prerequisites: EDAD 5301, EDAD 5355, ELHE 5300, ELHE 5301, ELHE 5302, ELHE 5303, ELHE 5304, ELHE 5305, EDTC 5349.

# English

## Courses

**ENGL 0303. Basic Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Provides students with instruction in the basics of acceptable writing, with special focus on preparing them to succeed in the writing demanded throughout the Tarleton State University freshman composition sequence. The course helps students address writing problems by work in such areas as the composing process, arrangement, cohesion, paragraphing, syntax, and use of evidence. The course also helps students (on an individual basis) with their particular problems in grammar, usage, punctuation, and spelling. A student must earn a grade of at least C in order to progress to ENGL 1301. The course will not substitute for any other course and does not count for degree credit.

**ENGL 1100. Transitioning to University Studies in English. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to introduce English majors to university life and to the career possibilities available in this major. Students will develop skills for academic success, development of personal growth and responsibility, and will engage in active involvement in the learning process from an individual college perspective.

**ENGL 1301. Composition I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A prerequisite to English 1302, the course introduces students to the diverse characteristics of writing for academic contexts. Students in English 1301 write about ideas, in particular responding analytically and critically to written sources. The course helps students become familiar with academic audiences, situations, purposes, genres, and some primary conventions (style, arrangement) of those genres. Moreover, students work to develop their own composing processes, particularly for ways of inventing ideas, planning, and revising their texts.

**ENGL 1302. Composition II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A sequel to English 1301, this course introduces students to research in academic contexts. Students address questions such as What is it for? What are its limitations? What are some of its shapes? How does one go about it? The course introduces students to a variety of research methods, systems of documentation, contemporary library resources, and research genres. Among other writing tasks for the course, each student is expected to carry out his/her own research study for possible publication in The Tarleton Freshman Writer. Prerequisite: ENGL 1301.

**ENGL 2320. Forms of Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A genre-based study of predominantly modern literary works. Students will analyze form and content with particular emphasis on the vocabulary and techniques germane to literature, investigate its attendant treatment as an academic discipline, and explore its aesthetic connections to human experience. Prerequisites: ENGL 1301 and 1302.

**ENGL 2340. Literature and Film. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of styles, components, and techniques of literary genres, with particular attention to the medium of film as it relates to literary expression. Students will be required to source films from streaming services or library resources. Prerequisites: ENGL 1301 and 1302 or prior approval of department head.

**ENGL 2350. Backgrounds of Western Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of major works in translation which provide the foundation for the literary tradition of the modern Western world, emphasizing, but not limited to, the Ancient World, the Middle Ages, and the Renaissance. Prerequisite: ENGL 1301 and 1302.

**ENGL 3195. Written Discourse Theory and Application. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Students will receive instruction and training in written discourse theory and practice as appropriate and necessary preparation for tutoring in the University Writing Center and/or the English and Languages Department Language Arts Lab. Students must receive prior approval to enroll. Prerequisites: ENGL 1301, 1302, 3 hours sophomore ENGL, and approval of Writing Program Director and Writing Center Directors.

**ENGL 3301. American Literature to 1865. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
From the beginnings to 1865. A critical survey of major writers and movements with emphasis upon such representative authors as Poe, Emerson, Hawthorne, Thoreau, Dickinson, and Melville. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 3302. American Literature Since 1865. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
From 1865 to the present. A critical survey of major writers and movements with emphasis on such representative authors as Crane, Howells, Frost, Hemingway, and Faulkner. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 3309. Technical Writing and Document Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Process of developing technical information, including researching, drafting, editing, revising, and designing technical reports, proposals, manuals, job application documents and professional correspondence for specific audiences, using word processing and graphic applications. Prerequisites: ENGL 1301 and 1302.

**ENGL 3310. Technical Writing and Editing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Study of advanced technical communication situations such as formal reports, grant proposals, and professional articles, and extensive discipline-specific professional level practice in these forms. Study of general editorial techniques in formats, graphics, and layout and design methods in technical publications. Prerequisites: ENGL 1301, 1302, and 3 hours sophomore ENGL, ENGL 3309.

**ENGL 3312. Graphics and Technical Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course will examine the integration of graphic components in printed and electronic mediums. Students will use computer applications to compose and design graphics such as bar graphs, organizational charts, flow charts, diagrams, and drawings. Prerequisites: ENGL 1301, 1302, and 3 hours sophomore ENGL, ENGL 3309.

**ENGL 3315. Foundations of Literary Research and Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An introduction to the skills, practices, and perspectives that inform literary research and analysis. The course explores how careful reading, close textual analysis, and creative and informed research methodology culminate in cogent and substantive critical essays about literary texts. The course includes discussion of the formal conventions of major literary genres as well as discussion of concepts such as relationships of literary texts to histories and cultures, the formation of canons, literary movements, and theoretical perspectives that inform literary analysis. This course is required for majors. May be taken concurrently with one other advanced English literature course before proceeding with other advanced English literature courses. Prerequisites: ENGL 1301, 1302, and 3 hours of Sophomore English.

**ENGL 3320. Advanced Grammar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the grammatical structure of modern English at the level of word, clause, and discourse presented through the application of the principles of descriptive grammars, accompanied by a review of current prescriptive grammars. Prerequisites: ENGL 1301, 1302, and 3 hours sophomore ENGL.

**ENGL 3330. Advanced Composition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Students will examine the rhetoric of composition through intensive writing workshops and close reading of composition-related texts. The goals of the course are (1) to discover and define some coherent relations between rhetoric and composition; (2) to challenge the students' presuppositions about essayistic space through a process of peer- and instructor-reviewed writing workshops. Prerequisites: ENGL 1301, 1302, and 3 hours sophomore ENGL, or prior approval of department head.

**ENGL 3341. Cultural Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course explores an array of diverse cultural and historical contexts through literature produced outside the common British and American traditions. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 3342. Genre Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Literary genres consist of related kinds of works, combining content and form, gradually changing as their cultures change. The purpose of generic study is an understanding of literary tradition and of the way in which authors speak to their times, and to all times, through the genres they inherit and modify. This course will provide an intensive study of one or more genres. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 3343. Creative Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on the craft and art of writing narrative, poetic, and dramatic discourse. Attention to the conception, design, and execution both of the whole work and of elements of figurative language, characterization, dialogue, point of view, and poetic structure, as well as other elements of the craft. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 3350. Children's Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A general survey of literature for children. Includes a study of types of literature for children and of the development of criteria for the selection and evaluation of children's books. This course may be counted as an elective but not towards the 24-hour advanced English requirement for an English major. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 3370. An Introduction to Linguistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of descriptive linguistics revealing the nature and scope of the characteristics and complexities of human language. Much of the course consists of learning the phonology, morphology, syntax, semantics, and pragmatics of modern English. Attention will also be focused on the nature and diversity of the rule-bound creativity underlying the tacit systematic use of human language. Prerequisites: ENGL 1301, 1302, and 3 hours sophomore ENGL.

**ENGL 3390. Readings in Adolescent Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Survey of literature with a focus on teenage audiences. Readings will include both classics and contemporary selections. Study will be concerned with increasing student understanding of unique aspects of adolescent literature and its application in public school curricula. Prerequisites: ENGL 1301,1302, 3315 and 3 hours sophomore ENGL.

**ENGL 4086. English Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course featuring independent reading, research, and discussion under personal direction of instructor, topics to vary according to student need. Open to students of senior classification with prior approval of department head.

**ENGL 4300. Shakespeare. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in depth study of representative types of Shakespeare's drama and poetry. Credit for both ENGL 4300 and DRAM 4300 will not be awarded. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 4301. British Literature I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A chronological study of the works of the principal authors and their historic backgrounds from approximately 700 A.D. to the end of the eighteenth century. The writers considered include Chaucer, Shakespeare, Milton, Pope, and Swift. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 4302. British Literature II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A chronological study of the works of the principal authors and their historic backgrounds from the end of the eighteenth century to the present. The writers considered include Wordsworth, Coleridge, Tennyson, Browning, and Eliot. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 4311. Studies in Rhetoric and Language. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course offers advanced study in the theory, nature, and practice of written discourse. Special emphasis is given to helping students investigate language theoretically as a background for their own professional and personal use. Prerequisites: ENGL 1301, 1302, and 3 hours sophomore ENGL.

**ENGL 4312. Technical Writing and Computer Applications. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of and practice in use of word processing and desktop publishing in document design and publication. Prerequisites: ENGL 1301, 1302, 3 hours sophomore ENGL, ENGL 3309, ENGL 3312.

**ENGL 4315. Senior Literacy Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course offers an opportunity for students to engage in an intensified, focused, well-defined study. Possibilities include the examination of a particular writer, groupings of writers, a specific geographic region, and/or literary criticism. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 4320. Writing for Electronic Mediums. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced study of and practice in writing for electronic mediums with a primary focus on planning, designing, and composing professional pages for the world wide web. Prerequisites: ENGL 1301, 1302, 3 hours sophomore ENGL, ENGL 3309, 3312.

**ENGL 4335. Film Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of movies both as dramas - involving plot, characterization, theme, etc. - and as artistic productions - involving shots, cuts, and other film techniques. Other aspects of film criticism are covered. A three-hour lab per week is required. Prerequisites: ENGL 1301, 1302, 3315 and 3 hours sophomore ENGL.

**ENGL 4360. Advanced Studies in Secondary English. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course applies the standards of the National Council of Teachers of English to the curriculum of secondary English. It provides an intensive review of composition principles, language conventions, literary genres, and computer instructional technology. Prerequisites: ENGL 1301, 1302, and 3 hours sophomore ENGL.

**ENGL 5085. English Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Content varies according to the needs and desires of the students. When topic varies, course may be taken for credit more than once. Open to students of graduate classification.

**ENGL 5086. Special Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Conference course. Directed independent study under supervision of a senior faculty member.

**ENGL 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when student is ready to begin thesis. No credit until thesis is accepted. Prerequisites: 24 hours of graduate credit, including ENGL 5398, and prior approval of department head.

**ENGL 5310. Studies in American Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on restricted periods in American literary history. Examples include colonial American literature, the American Renaissance, American literary naturalism, post-World War II American literature, and minority literature in America. May be repeated for credit when topics vary.

**ENGL 5312. Studies in British Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Exploration of topics in British literature. Major and minor authors, single or multiple genres, and various themes may be covered, depending on instructor's choice of topic. May be repeated once for course credit when topics vary.

**ENGL 5314. Literary Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The focus of this course is to introduce students to literary theory, either via a broad diachronic study or by examining a particular critical approach as it applies to literary texts, depending on instructor's choice of topic. May be repeated for course credit when the topic varies.

**ENGL 5320. Studies in the English Language. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on historical and/or linguistic study of the English language. Topics will vary. Examples include history of the English language and the English language in America. May be repeated for credit when topics vary.

**ENGL 5321. Psycholinguistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Deals with a variety of formal cognitive mechanisms that are relevant to the knowledge and use of natural languages. Primary emphasis is on the modular view of the mind and its consequences for both L1 and L2 language acquisition.

**ENGL 5330. Studies in Rhetoric. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of written language theories. Course contents include readings from a wide spectrum including classical Greece and Rome, the European enlightenment, nineteenth century America, and modern and post-modern periods. May be retaken for credit when topics vary.

**ENGL 5331. History of Rhetoric I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The Classical Era through the Enlightenment – A survey of the early history of rhetorical study. Course contents include readings from classical Greece and Rome as well as significant eras such as the Medieval period, the Renaissance, and the European Enlightenment.

**ENGL 5332. History of Rhetoric II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Continuation of the study of rhetorical history. Course contents include readings from the nineteenth century as well as modern and postmodern rhetorical studies. The course places a particular emphasis on discourse analysis and contemporary application of rhetorical theory.

**ENGL 5333. Rhetorical Criticism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explores the principles of rhetorical theory and criticism for writing studies and technical communication. Analysis of a variety of popular and political and persuasive messages, which may include political speeches, commercial advertising, artwork, song lyrics, scientific articles for popular audiences and within science communities, workplace writing, writing for social media, and other forms of purposeful presentation of argument.

**ENGL 5334. Introduction to Visual Rhetoric. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduces theories of visual rhetoric and visual design, especially as applied to instructions and presentation of technical and scientific content.

**ENGL 5335. Seminar in Professional Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This class studies the theory and practical applications at work in the production of technical and professional documents. Students will study and produce written documents for a variety of audiences and fields.

**ENGL 5336. Grant and Proposal Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles and practice in writing grant applications and proposals, including finding grants. May include a service learning project.

**ENGL 5337. Intercultural Technical and Professional Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Considers the implications of communicating scientific and technical content and information to many cultures. Looks at technical communication in light of cultural values and cultural mores.

**ENGL 5338. Technical Editing: Practice and Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explores the practices and processes of technical, professional, and workplace editing and the theories that support those practices. Covers hand and electronic markup and editing as applied to text, document design, and information architecture. Students complete an editing project from analysis to delivery.

**ENGL 5340. Studies in Modern Fiction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An evaluation of English and American short stories, novels, and related criticism. Topics will vary and will include study of themes and development of the genre. May be repeated for credit when topics vary.

**ENGL 5345. Film Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The focus of this course is to introduce students to film as a literary medium. Through a focused study of films and varied film industries, students will examine the narrative qualities central to the filmic experience. Students will also explore genre theory and the formulas of genre.

**ENGL 5350. Studies in Literature Before 1500. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of representative types of pre-1500 literature in English. Topics may vary. May be repeated for credit when topics vary.

**ENGL 5360. Modern American and British Poetry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of representative themes in the development of American and English poetry. Related critical readings will be studied. Topics will vary. May be repeated for credit when topics vary.

**ENGL 5370. Studies in Comparative Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A comparative study of great literature in the world in translation. Topics may vary and may include examination of theme, technique, and type. May be repeated for credit when topics vary.

**ENGL 5371. Scholarly Writing in Health. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Intensive scholarly writing in the health sciences and related fields emphasizing elements and techniques of credible, scholarly writing and critical thinking. This courses utilizes American Psychological Association (APA) format and style. Student evolution in writing will be developed through sequential papers and faculty/peer feedback.

**ENGL 5380. Studies in the Teaching of Composition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course is devoted to the study of the aims, skills, materials, and practices of composition teaching at college and junior college levels. May be repeated for credit when topics vary.

**ENGL 5396. Digital Humanities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course brings students to the intersection of humanities research and the digital age, as they explore methods of research, presentation and communication within the field. We will trace the advent of digital scholarship at the end of the 20th century and confront the multiple forms of publication open to scholars in the 21st. While recognizing that hard copy research and writing will never be removed from the fields of scholarship, we must accept that humanities research has begun to move and continues to move forward via online and electronic formats. Students will learn how to conduct research using digitized texts and manuscripts and will create their own portfolios, demonstrating different methods of digital communication for a single topic. In addition to reading some of the major innovators in the area of digital humanities, students will also work with programs to create visual and audio components of their research.

**ENGL 5397. Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).**
Supervised professional activities in the college composition classroom including presentations, evaluation, and conferences. May be repeated once for credit. Field experience fee $50.

**ENGL 5398. Methods of Bibliography and Research Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to methods of research and effective utilization of library resources. May include analytical bibliography, enumerative bibliography, and textual criticism.

# Engineering

## Courses

**ENGR 1100. Transitioning to University Studies in Engineering. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of engineering and computer science disciplines.

**ENGR 1211. Engineering Fundamentals I. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Introduction to engineering fundamentals including problem solving, algorithm development, and design; computer applications including spreadsheet and programming; engineering as a profession, ethics, teamwork and communication. Corequisite: MATH 2412 or 1316. Lab fee: $20.

**ENGR 1212. Engineering Fundamentals II. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Development of skills in problem solving, design, analysis, estimation, communication and teamwork; introduction to accounting and conservation principles in engineering sciences emphasis on computer applications and programming. Prerequisites: ENGR 1211; MATH 2413 or concurrent registration, PHYS 2425 or concurrent registration. Lab fee: $20.

**ENGR 2251. Fundamentals of GIS for Engineers. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
This course offers an introduction to methods of managing and processing geographic information. Basic principles of geographic information systems and their use in spatial analysis and information management are introduced. Students gain experience with cutting-edge geospatial technologies and an understanding of their capabilities. Application in engineering is emphasized. Prerequisite: MATH 2413 or concurrent registration Lab fee: $2.

**ENGR 2303. Engineering Economy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of economics equivalence; time value of money, analysis of single and multiple investments; comparison of alternatives; capital recovery and tax implications; certainty; uncertainty; risk analysis; public sector analysis; and break-even concepts. Prerequisites: MATH 2413 or concurrent registration.

**ENGR 2321. Engineering Mechanics: Statics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theory and analysis of bodies in equilibrium, including vector algebra, Newtonian mechanics, forces due to friction; forces acting on members of trusses and frame structures, and determinations of centroids and moments of inertia. Prerequisites: MATH 2414 (coreq), and either ENGR 1212(prereq) and PHYS 2425(coreq), or PHYS 2425(prereq) and ENGR 1212(coreq).

**ENGR 2322. Engineering Thermodynamics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theory and application of energy methods in engineering; conservation principles to investigate traditional thermodynamics (e.g., temperature, thermodynamic equilibrium, and heat). Prerequisite: ENGR 1212; MATH 2414 or concurrent registration.

**ENGR 2324. Engineering Mechanics: Dynamics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Application of theory and principles of mechanics to dynamic particles and rigid body systems in rectilinear and curvilinear systems, including forces, acceleration, conservation of energy, and impulse and momentum. Prerequisites: ENGR 2321 and MATH 2414.

**ENGR 3311. Engineering Mathematical Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course presents mathematical techniques frequently encountered in advanced engineering analyses. The topics include the following areas: linear algebra, including matrix and eigenvalue applications; probability and statistics, including descriptive and inferential statistics, probability densities, statistical simulations and quality control. Prerequisites: MATH 2413 and ENGR 1212.

**ENGR 4086. Special Problems. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 1-4 Hours).**
Directed study of selected topics in Engineering. May be repeated with approval of department head.

**ENGR 4259. Engineering Capstone I. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
This course is the first part of the capstone design experience synthesizing knowledge, skills and values necessary in engineering practice. Includes FE review sessions, engineering ethics, design process including multiple realistic constraints such as social, economic, safety, and sustainability, and the impact of engineering solutions in a global, economic, environmental, and societal context. During this course students develop a proposal for their capstone project. Prerequisite: Within one year of graduation with one of the engineering BS degrees. Lab fee: $2.

**ENGR 4360. Engineering Capstone II. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is part 2 of the culminating design experience in the last year of the curriculum used to integrate the student's education. Includes reference to business concepts, mathematics, science, engineering and humanities. Emphasizes team work, a holistic approach to problem solving, and incorporates appropriate engineering standards and multiple realistic constraints. Prerequisite: ENGR 4259 Lab fee: $2.

# Engineering Technology

## Courses

**ENGT 1100. Transitioning to University Studies in Engineering Technology. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of Engineering Technology.

**ENGT 1305. Principles of Drafting. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An introduction to mechanical drafting involving geometrical constructions, orthographic projection, dimensioning techniques, sectional views, auxiliary views, isometric views, and other topics related to manufacturing and other areas of drafting. Lab fee $10.

**ENGT 1306. Applied Statics. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course will focus on understanding the resolution and composition of forces and moments; free-body diagrams; equilibrium of particles and rigid bodies; simple structures; friction; centroid; moments of inertia. Prerequisite: Concurrent with MATH 1316 or 2412.

**ENGT 1317. Machining Technology. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of metals and their machining characteristics and application. Emphasis is placed on layout, precision measurement, and heat treating. Laboratory experiences include work with sheet metal, metal casting, and metal lathe operation. Lab fee $2.

**ENGT 2303. Engineering Economy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of economics equivalence; time value of money, analysis of single and multiple investments; comparison of alternatives; capital recovery and tax implications; certainty; uncertainty; risk analysis; public sector analysis; and break-even concepts. Prerequisite: MATH 1316, MATH 2412, or MATH 2413.

**ENGT 2309. Electrical Circuits. 3 Credit Hours (Lecture: 2 Hours, Lab: 5 Hours).**
Principles of electricity, magnetism, and basic laws. Fundamentals of analog and digital electronic components and circuits, including applied areas. Laboratory involves experiments with basic circuits and test equipment. Lab fee: $2.

**ENGT 2310. Introduction to Manufacturing Processes. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A study of metals and their machining characteristics and application. Emphasis is placed on layout, precision measurement, and heat treating. Laboratory experiences include work with sheet metal, metal casting, and metal lathe operation. Lab fee $10.

**ENGT 2335. Solid Modeling. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A study of complex three-dimensional solid models used in the fields of mechanical engineering, sheet metal, welding, and other areas of manufacturing and engineering. Orthographic views projected from solid models and annotation techniques are used to produce engineering drawings. Prerequisite: ENGT 1305 or 3 semester hours of drafting or approval of the instructor. Lab fee $10.

**ENGT 3099. Cooperative Education. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 3-9 Hours).**
This course is designed to offer students the opportunity to integrate academic study with work experience that is germane to their major or minor. Enrollment requires a two-semester minimum commitment that may be accomplished by 1) alternating semesters of full-time study with semesters of curriculum-related employment, or 2) enrolling in courses at least half-time (6 semester hours) and working part-time in parallel positions of curriculum-related employment. The department Cooperative Education advisor will supervise the student's experience and assign the final grade based on the student's final report which is required to complete the course. Students may participate in the Cooperative Education program for an unlimited number of semesters but a maximum of 6 hours credit may be counted toward a degree. Prerequisites: Completion of 30 semester hours which includes 12 hours in the major or minor discipline in which the Cooperative Education course is desired, minimum overall GPA of 2.5 and a minimum GPA of 3.0 in the appropriate major or minor field, and department head approval. Field experiences fee $50.

**ENGT 3301. Applied Dynamics. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course will focus on understanding the kinematics and kinetics of particles and rigid bodies. It will cover general particle and two-dimensional rigid body motion and will include the concepts of impulse and momentum and the principle of work and energy. Prerequisites: MATH 2413 and ENGT 1306.

**ENGT 3303. Industrial Materials. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the structure, properties, processing, and application of metallic, polymeric, ceramic, and composite materials utilized in manufacturing. Laboratory exercises include processing methods, physical and mechanical testing, modification of properties, manufacturing applications, and material identification. Prerequisites: CHEM 1411 and ENGL 1302 Lab fee $2.

**ENGT 3304. Manufacturing Materials. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the properties, processing, and application of metallic, polymeric, ceramic, and composite materials utilized in manufacturing. Emphasis is placed on broad characteristics and applications of industrial materials.

**ENGT 3305. Machine Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Application of mechanics and strength of materials to the analysis, synthesis and design of machine elements; theories of failure, stress concentrations, fatigue life and thermal stress, consideration of economics and safety; projects in creative mechanical design. Prerequisite: MATH 2413 and ENGT 3313.

**ENGT 3309. Control Systems for Mechanical Application. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Application of computers to control industrial processes. Study of continuous- and discrete-time control algorithms; digital signal processing; and system control concepts applied to process control. Prerequisite: ENGT 2303. Lab fee: $2.

**ENGT 3313. Mechanics of Materials. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Stresses and strains in elastic members under tensile, compressive, shearing, torsional and bending loads; combined stresses; shear and moment diagrams; Mohr's circle; deflection of beams; thin-walled pressure vessels; stability of columns and buckling. Prerequisites: Concurrent with MATH 2413 and ENGT 1306.

**ENGT 3314. Principles of Technology Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the Texas Technology Education curriculum, to include the areas of communication, manufacturing, construction, energy, power, transportation, computer applications, bio-related technology, electricity, electronics, graphics, principles of technology, and other related technologies.

**ENGT 3316. Manufacturing Systems. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A study of organizational and production techniques used in manufacturing. A thematic team approach will be used to design and produce a product using principles of mass production. Concepts of manufacturing that will be studied will include: principles of tooling, quality, plant layout, resource planning and scheduling. Prerequisites: ENGT 1305, 1317.

**ENGT 3317. Machine Tool Technology. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Fundamentals and principles of metal removal processes. Emphasis is placed on metal lathes, milling machines, grinding machines, and electric discharge machines. Prerequisite: ENGT 1317. Lab fee $10.

**ENGT 3318. Research and Reporting For Technologists. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of research tools, methods, and data collection techniques used in the field of Engineering Technology. Emphasis will be placed on gathering, analyzing, and presenting technical information related to manufacturing topics in both oral and written form. Technical reports, product documentation, and correspondence will also be discussed.

**ENGT 3319. Motor Control and Machine Automation. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A study of power transformers, single and multiphase circuits. The study of DC machines, AC single and multiphase synchronous and induction machines, and an introduction to power electronics. Lab fee: $2.

**ENGT 3320. Industrial Safety. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of principles and practices used to establish a safe and healthful environment for industrial personnel. Includes a study of general industrial safety, safety and health regulation agencies, hazard recognition and correction, and first aid. Credit for both ENGT 3320 and MGMT 3320 will not be awarded.

**ENGT 3323. Computer-Aided Design with AutoCAD. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The application of the principles of computer-aided design as they relate to manufacturing and construction. Computerized generation of drafting and design data, using AutoCAD, to create two- and three-dimensional geometries.

**ENGT 3324. Applied Polymer Processing. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course is a study of thermoplastic and thermosetting materials and processes used in plastics manufacturing. Emphasis will be placed on injection molding, thermoforming, extrusion, rotational casting, elastomeric mold fabrication, resin casting, and coatings. Also, the impact of material selection on processing parameters will be stressed. Prerequisite: ENGT 3303. Lab fee: $2.

**ENGT 3325. Composites Manufacturing. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course includes a study of basic organic-matrix composites manufacturing and assembly processes, especially as these relate to aerospace and construction composite products. Lab exercises will include composite hand layup procedures, composite tool design, pultrusion, and assembly processes for composite products. Prerequisite: ENGT 3303. Lab fee: $2.

**ENGT 3326. Ergonomics and Work Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the design of man-machine systems with particular emphasis on the application of ergonomics to the manufacturing workplace and environment. Use of anthropometric data in design; limitations of human performance; effects of environmental stress on work performance, safety, and health. Lab fee $2.

**ENGT 3327. Mechanical Analysis. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
The course provides information on the current state of Finite Element Analysis (FEA) technology, underlying theory, and its use in engineering design. The primary focus of the course is on linear static analysis. More advanced techniques such as nonlinear analysis in FEA will be covered if time permits. Software will be used to perform FEA on lab projects. Prerequisite: ENGT 3313.

**ENGT 3336. Industrial Controls. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
The theory and application of electronic programmable devices such as programmable logic controllers, temperature controllers, counters, etc. Emphasis is also given to control devices using pneumatics and hydraulics. Ladder logic and input/output devices will be emphasized. Lab Fee: $10.00.

**ENGT 3345. Industrial Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An application based course that exposes students to industrial design and provides experience in the varied aspects of the design process, culminating in a final, individual design project. Topics include, but are not limited to: Working drawings, tolerancing, dimensioning, material selection and pricing, sketching and proper design techniques. Prerequisite: ENGT 2335 or approval of the instructor. Lab fee $2.

**ENGT 3350. Numerical Control Systems. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Principles, techniques, and applications of numerically controlled machine tools. Application of the APT system. Laboratory experiences in processing, writing, debugging, and processing the N/C part program. Prerequisite: ENGT 1317 or approval of the instructor. Lab fee $10.

**ENGT 3360. Safety Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Occupational safety engineering and management with emphasis on control of hazardous materials, fire prevention, safety considerations in production facility design and maintenance, and operation of effective safety programs.

**ENGT 3375. Continuous Improvement. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The role of the manufacturing engineer in continuous improvement projects to improve design and production processes. The student will utilize modern tools and techniques for planning and managing continuous improvement projects, integrating and deploying change programs, data based decision making, and resource management.

**ENGT 3385. Fluid Mechanics. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course is an introduction to fluid mechanics, and emphasizes fundamental concepts and problem-solving techniques. Topics to be covered include fluid properties, fluid statics, fluid kinematics, control volume analysis, internal flows (pipe flows), and external flows (lift and drag). Brief introductions to computational fluid dynamics (CFD), compressible flow, and fluid power systems such as turbomachinery (pumps and turbines) will also be provided. Prerequisites: MATH 2413.

**ENGT 3386. Quality Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the application of various methods used by manufacturing to quantify product quality. This will include a review of the ASTM, ANSI, and ISO tests as they apply to metallic, polymeric, ceramic, and composite materials. Statistical Quality Control, Statistical Process Control, Total Quality Management, and ISO 9000 will also be investigated. Laboratory assignments will acquaint the student with the variety of instrumentation that is used in quality control and their use. Lab fee $2.

**ENGT 3393. Modular Technology. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course will investigate various systems used in modular technology education. Modular technology studies will include broadcasting technology, applied physics, power energy, transportation, graphic communication, composites, and computer application. Prerequisite: junior standing. Lab fee $15.

**ENGT 3395. Fundamentals of Industrial Project Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
As an introductory course for project management, the course covers essential elements to successfully initiate and complete a project in general. Topics will include five of the basic elements of project management; project initiation, planning, executing, controlling and closing a project. The course includes the use of Project Management software.

**ENGT 395. Industrial Project Management. 5 Credit Hours (Lecture: 0 Hours, Lab: 0 Hours).**

**ENGT 4086. Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
This course is designed to meet the needs of Engineering Technology students who have above average academic ability and who need to pursue subject matter that is not normally included in the Engineering Technology curriculum. Approval for enrollment in this course shall be with the concurrence of the individual instructor and the department head. The student must be currently enrolled in one of the majors offered in the Engineering Technology Department. Prerequisite: completion of 30 or more hours in the Department of Engineering Technology.

**ENGT 4303. Weld Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
This course presents the basics of weld design, welded structure manufacturing, and structural design as it applies to welded structures.

**ENGT 4305. Architectural Drafting. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A course in residential architectural drafting using computer-aided drafting. Emphasis is placed on residential design and home planning. Lab fee $10.

**ENGT 4320. Occupational Safety and Health. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of principles and practices used to establish a safety and health program within industrial and retail environments. The course includes a study of general safety regulations and occupational safety program strategies as they pertain to internal organizational efforts. Related topics such as safety and health regulation agencies, hazard recognition and correction, and first aid.

**ENGT 4322. Applied Thermodynamics. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The study of the basic concepts and laws of thermodynamics and the application of these laws or principles to simple engineering systems. Topics include the First Law of Thermodynamics, the Second Law of Thermodynamics, thermodynamic properties, and various cycles. Prerequisite: MATH 2414.

**ENGT 4326. Applications of Linear Programming and Optimization. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An introduction to applications of linear and nonlinear programming, single and multiple objective optimization, sensitivity, forecasting, queuing theory, and decision analysis. The student will be able to implement these concepts using a COTS software application as applied in industrial and public settings. Lab fee $10.

**ENGT 4336. Production Planning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the principles and theory used in the design and maintenance of production operations and inventory systems. These include forecasting techniques, inventory models, production control models and assembly line balancing. Particular emphasis is on MRP. Just-in-Time, and Synchronous Manufacturing.

**ENGT 4339. Process Control Instrumentation. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Introduction to process control principles and practices. Study of analog and digital signal conditioning; thermal, mechanical and optical transducers; electromechanical, pneumatic and hydraulic devices; and the application of computer-aided tools for process control instrumentation. Prerequisite: ENGT 3336, 3309. Lab fee: $2.

**ENGT 4346. Manufacturing Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Applications of modern manufacturing principles including: design for manufacturability, group technology, just-in-time, synchronous manufacturing, concurrent engineering, flexible manufacturing, and product management to effectively manage the manufacturing environment.

**ENGT 4347. Metrics and Measurements. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers topics in ergonomics, the man-machine interface, managing worker methods, and time studies. We will cover topics that lead to measuring and monitoring work both by human and machines. Prerequisite: ENGT 3375.

**ENGT 4350. NUmerical Control Programming. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A continuation of I T 350 in which more advanced programming techniques are studied. Included is a study of the various N/C part programming languages, and evaluation of N/C equipment and the further refinement of the APT/NC language. Prerequisite: ENGT 3350. Lab fee $10.

**ENGT 4356. Advanced Industrial Controls. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
Feedback control system analysis. Proportional, integral and derivative controls of automated systems. Control system design and compensation. Analog and digital simulation. Prerequisite: MATH 2413, ENGT 3336.

**ENGT 4361. Computer Aided Manufacturing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The principles of computer aided manufacturing and simulation as they relate to mechanical design and assemblies. Software tools will be used to analyze parametric parts and assemblies for strength, function, range of motion and interference. Prerequisite: Approval of the instructor.

**ENGT 4375. Facility Planning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers topics in Facilities Planning and design for Operations. We will cover topics that lead to making good decisions for facility layout including product, process flow, material handling, and facility location techniques. Prerequisite: ENGT 3375.

**ENGT 4376. Automated Manufacturing Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An analysis of materials flows to design automated manufacturing systems in the manufacturing environment. This will include material handling systems, how computer-aided manufacturing software improves productivity, automated storage and retrieval systems, automated guided vehicles, bar-coding systems, automated warehousing, and the programming and application of robots.

**ENGT 4384. Internship. 3 Credit Hours (Lecture: 0 Hours, Lab: 6 Hours).**
An approved, supervised, comprehensive work experience consisting of a minimum of 240 hours (6 weeks) in an industrial or manufacturing enterprise. Prerequisite Course(s): Junior or senior classification and approval of academic advisor and department head. The internship may be repeated for a maximum of 6 hours of credit. Field experience fee $75.

**ENGT 4385. Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will vary according to timeliness and special needs. May be taken more than once for credit.

**ENGT 4395. Engineering Technology Projects. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
A capstone projects course emphasizing a team approach to the analysis and solutions of manufacturing problems. Projects will be supplied by industry whenever possible. Emphasizes scheduling, design, working in teams, final written report and presentation. Restricted to Engineering Technology majors. Prerequisite: Senior standing. Lab fee $15.

**ENGT 5086. Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
This course is designed to meet the needs of Manufacturing Quality and Leadership students who have above average academic ability and who need to pursue subject matter that is not normally included in the Manufacturing Quality and Leadership curriculum. Approval for enrollment in this course shall be with the concurrence of the individual instructor and the department head.

**ENGT 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
This course is designed to meet the needs of Manufacturing Quality and Leadership students who have above average academic ability and who need to pursue subject matter that is not normally included in the Manufacturing Quality and Leadership curriculum. Approval for enrollment in this course shall be with the concurrence of the individual instructor and the department head.

**ENGT 5303. Engineering Economics and Decision Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of engineering costs and capital investments. Applications of classical optimization, mathematical programming, and the theory of production to the analysis of investment proposals. Evaluation and selection of individual projects and formulation of capital investment programs.

**ENGT 5324. Statistics for Quality. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to decision making for technologists using quantitative methods. The emphasis will be on identifying opportunities for process/product improvement in manufacturing using statistical applications. Besides exploratory data analysis, basic probability, distribution theory and statistical inference will be covered. Special topics will include experimental design, regression, control charts and acceptance sampling.

**ENGT 5325. Six SIgma and Design of Experiments. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to design and analysis of experiments. Applications in product and process design and development; process correction and quality improvement. Taguchi's loss-function approach to quality. Strategies for reliable data acquisition and validation will be addressed. Prerequisites: ENGT 5368, ENGT 5324.

**ENGT 5332. Financial Risk for Engineering Project Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide an understanding of the project financial risk impacts as they relate to Engineering Technology projects. The course will focus on the combination risks and impacts of quality and financial issues as they relate to other Manufacturing Quality and Engineering Technology Practices.

**ENGT 5336. Manufacturing Planning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics that will be covered include strategic issues such as the design of products and services, and the design of processes and facilities. Planning and controlling activities including capacity planning, quality control, inventory control, scheduling, and project planning are covered. The emphasis of this course will be on the development and application of analytical methods and techniques Prerequisites: ENGT 5324 or concurrent enrollment.

**ENGT 5346. Manufacturing Systems Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of concepts and models used as a competitive advantage in the management of processes to produce and supply goods in the manufacturing/service industries. Topics will include operations management and strategy, product design and learning curves, project management, Manufacturing/Service process selection and design. Applications of Operations Research science techniques enable the development of the Manufacturing Systems Management methodologies.

**ENGT 5362. Supply Chain Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Exploration of the key issues associated with the design and management of industrial supply chains. Supply Chains are concerned with the efficient integration of suppliers, factories, warehouses and stores so that products are distributed to customers in the right quantity and at the right time. The course will focus on minimizing the total supply chain cost subject to various service requirements.

**ENGT 5368. Quality Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course focuses on manufacturing related principles and best practices reflected in ISO 9000 Standards. Topics included are: manufacturing process improvement; process orientation; quality function deployment; process control and capability; role of inspection; economics of quality; and productivity measurement. Emphasizes role of ISO certification in the global market along with the contributions of Deming, Juran, and Crosby. Prerequisites: ENGT 5324 or concurrent enrollment.

**ENGT 5376. Automated Manufacturing Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**

**ENGT 5385. Project Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course explores major problems, tasks and techniques required to manage the technical program in each phase of the product life cycle. Organizational planning, decision-making, and internal external interface techniques for each phase of the project life cycle are addressed. Additional concepts such as: Earned Value Analysis (EVA), Critical Path Management (CPM), Project Requirements Analysis, and Schedule Task Analysis will be explored in depth. Prerequisite: ENGT 5368.

**ENGT 5398. Seminar in Manufacturing Quality Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course guides the student toward an in-depth understanding of the principles, techniques and applications of quality in modern manufacturing companies. The student will review current literature in the field of quality management and write a comprehensive proposal or report on the topic. Prerequisites: ENGT 5325 or concurrent enrollment.

# Engineering Physics

## Courses

# Environmental Engineering

## Courses

**ENVE 2251. Fundamentals of GIS for Engineers. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
This course offers an introduction to methods of managing and processing geographic information. Basic principles of geographic information systems and their use in spatial analysis and information management are introduced. Students gain experience with cutting-edge geospatial technologies and an understanding of their capabilities. Application in engineering is emphasized. Prerequisite: MATH 2413 (coreq) Lab fee: $2.

**ENVE 2310. Introduction to Environmental Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to environmental and occupational health, atmospheric systems and air pollution control, hazardous waste management, solid waste management, waste water management, and water supply treatment. Prerequisites: CHEM 1409 or CHEM 1412, and MATH 2414.

**ENVE 2311. Soil Mechanics. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to the principles of soil and their influence on the hydrological cycle, Darcy's law and fluid flow through porous medium, stress distribution and consolidation of soil, subsurface exploration. Prerequisite: MATH 2413; PHYS 2425 or concurrent enrollment Lab fee: $2.

**ENVE 3300. Fluid Mechanics. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Principles of hydrostatics, dynamics of viscous and inviscid non-viscous fluids, resistance to flow in pipes and open channels, transport processes, energy equation, Bernoulli equation, conservation of mass, conservation of momentum, pump characteristics, similitude, dimensional analysis. Includes an introduction to computational analysis of fluid flow and pressure distributions and laboratory experiences. Prerequisites: PHYS 2425 and MATH 2414 Lab fee: $2.

**ENVE 3301. Environmental Systems Modeling. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Apply conceptual and numerical techniques to model environmental systems. Use differential equations to describe processes. Prerequisites: MATH 3306 and ENVE 2310 Lab fee: $2.

**ENVE 3310. Engineering Hydrology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Study of the hydrologic cycle, precipitation processes, soil moisture, infiltration, groundwater, rainfall-runoff processes, utilization of water resources, and frequency analysis; introduction to HEC-HMS programs for modeling hydrologic processes, elementary principles of field work. Prerequisite: ENVE 3300.

**ENVE 3333. Groundwater Contamination and Remediation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to the fundamentals of subsurface flow with emphasis on the examination of the fate and transport of inorganic and organic contaminants therein and their management. Topics include groundwater flow and well hydraulics, modeling of contaminant transport processes, site investigations, natural attenuation, remediation and legal issues in groundwater protection. Prerequisite: ENVE 3310; MATH 3306 or concurrent registration.

**ENVE 3340. Environmental Risk Assessment. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to the fundamentals of environmental and ecological risk assessment, including toxicity assessment, characterizing fate and transport processes in various environmental media, evaluating exposure pathways, dose-response assessment and modeling uncertainty. Prerequisites: ENVE 2310 and ENGR 3311 Lab fee: $2.

**ENVE 3400. Fluid Mechanics. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Principles of hydrostatics, dynamics of viscous and inviscid non-viscous fluids, resistance to flow in pipes and open channels, transport processes, energy equation, Bernoulli equation, conservation of mass, conservation of momentum, pump characteristics, similitude, dimensional analysis. Includes an introduction to computational analysis of fluid flow and pressure distributions and laboratory experiences. Prerequisites: PHYS 2425 and MATH 2414. Lab fee: $2.

**ENVE 3401. Environmental Systems Modeling. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Apply conceptual and numerical techniques to model environmental systems. Use differential equations to describe processes. Prerequisites: MATH 3306 and ENVE 2310. Lab fee $2.

**ENVE 3420. Groundwater Hydrology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Topics include aquifer characteristics, infiltration, fluid dynamics of groundwater flow, potential flows, well analysis, water quality, groundwater pollution, legal issues in groundwater. Credit for both HYDR 320 and ENVE 320 will not be awarded. Prerequisites: ENVE 2411, GEOL 1403 or ENVE 2310, CHEM 1412, MATH 2414. Lab fee $10.

**ENVE 3440. Environmental Risk Assessment. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to the fundamentals of environmental and ecological risk assessment, including toxicity assessment, characterizing fate and transport processes in various environmental media, evaluating exposure pathways, dose-response assessment and modeling uncertainty. Prerequisite: ENVE 2310 and either ENGR 3311 or MATH 3311 Lab fee: $2.

**ENVE 3450. Environmental Biotechnology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Application of fundamental principles of aquatic chemistry, molecular biology and biochemistry to understand and analyze complex chemical/biological processes in environmental engineering (natural and engineered systems). Prerequisite: CHEM 1409 or CHEM 1412, MATH 2414, ENVE 2310 Lab fee: $2.

**ENVE 4086. Special Problems. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 0 Hours).**
Directed study of selected topics in Environmental Engineering. May be repeated with approval of department head.

**ENVE 4302. Atmospheric Systems and Air Pollution Control. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of atmospheric impact on air pollution. Study of sources of air pollution and their control to include gases and particulate matter. Study of air pollution regulations and air pollution modeling. Design of systems to control and abate air pollution. Study and design of sampling systems to monitor air pollution. Prerequisite: CHEM 1409, ENGR 2322.

**ENVE 4310. Water Resources Engineering. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamentals of hydraulics applicable to open channel flow, natural streams and waterways; irrigation flow characteristics; hydrologic analysis; fluid measurement methods; introduction to hydraulic models including HEC-RAS; and economic aspects of water resources. Prerequisite: ENVE 3300.

**ENVE 4320. Water and Waste Water Treatment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Treatment and distribution of residential and industrial water supplies, waste water treatment and disposal methods of municipal and industrial systems, environmental toxicology; aspects of groundwater monitoring and water quality maintenance. Laboratory analysis of water and waste water quality. Design of elementary treatment, distribution, and collection systems. Prerequisites: CHEM 2423, or both CHEM 2323 and 2123, ENVE 2310, and ENVE 3300.

**ENVE 4325. Environmental Monitoring and Measurements. 3 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Studying and analyzing environmental engineering processes and systems through appropriate experimental methods. The course will include sampling, protocol development and design of experiments, relevant measurement techniques and experimental methods. Emphasis on quality control, calibration, documentation and interpretation of results facilitating the development of best practice approaches for experimental design and analysis. Prerequisites: Co-requisite of ENVE 2450 and ENVE 4320 Lab fee: $2.

**ENVE 4330. Texas Water Resource Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The ecological relation of water in this biosphere with special reference to the human role; the role of behavioral sciences (social, legal, economic, political, and psychological) in the development, conservation, regulation, and utilization of water resources; current political structure and laws pertaining to the administration of water resources in the state of Texas. Prerequisites: ENVE 3310 and GOVT 2306.

**ENVE 4350. Solid and Hazardous Waste Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to provide students with the necessary background and knowledge pertaining to the engineering design of solid and hazardous waste management and disposal. Topics covered include landfill design, resource conservation recovery and reuse, hazardous waste management. Prerequisites: CHEM 1409 or CHEM 1412, and ENVE 2310.

**ENVE 4420. Water and Waste Water Treatment. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Treatment and distribution of residential and industrial water supplies, waste water treatment and disposal methods of municipal and industrial systems, environmental toxicology; aspects of groundwater monitoring and water quality maintenance. Laboratory analysis of water and waste water quality. Design of elementary treatment, distribution, and collection systems. Prerequisites: CHEM 2423, ENVE 2310, and ENVE 3400 Lab fee $2.

# Environmental Science

## Courses

**ENVS 1100. Transitioning to University Studies and Environmental Science. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective.

**ENVS 1301. Society, Natural Resources, and the Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides a broad overview of the role of the environment and natural resources in human society, with particular emphasis on Texas and the United States. A history of the environmental movement is presented. Students study the importance of natural resources in providing basic human necessities, and how these resources are managed. Various careers in environmental science, natural resource management, and wildlife conservation are also discussed.

**ENVS 2451. Introduction to Geographic Information Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This is a cross-listed course with GEOG 2451 Intro to GIS. Basic concepts of design, planning and implementation of geographic information systems. Students will learn how to create, manipulate, project, and interpret geographic information. Students are encouraged to take GEOG 1451: Pre-GIS before this course. Lab fee: $2.

**ENVS 3302. Soils, Land Use, and The Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will examine the interactions among soil physical, chemical, and biological process affecting soil, water, and environmental quality. These interactions will be addressed in relation to land use management practices such as erosion control, soil conservation, soil reclamation, riparian buffers, bioswales, and artificial wetlands. Throughout the course, land use planning tools, including WebSoil Survey and GIS will be used. Prerequisites: WSES/ENVS/SOIL 3401, WSES/ENVS/SOIL 3301, or WSES/ENVS/SOIL 2375 and consent of the instructor.

**ENVS 3305. GIS for Natural Resource Scientists. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An intermediate course on the use of geographic information systems (GIS) in natural resource management. Builds on concepts learned in introductory GIS course. Laboratory exercises will apply knowledge learned in lectures to solve real world problems in natural resource management using GIS software. Prerequisite: WSES 2451.

**ENVS 3307. Systems Thinking. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course focuses on the examination and analysis of complex systems, particularly in the environmental, natural resources, and sustainability fields. Major topics will include system structure, system behavior, feedback loops, stock and flow models, non-linear and emergent properties, self-organization, and the application of systems thinking to problem-solving. A significant component of the course will be development and analysis of computer models of complex systems. Prerequisite: C or better in MATH 1314 or equivalent, or approval of the instructor.

**ENVS 3315. Sustainability. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explore the varied perspectives of sustainability and analyze factors that contribute to or decrease system sustainability. Investigation of the social, economic, and environmental barriers to achieving sustainable systems and options for overcoming these barriers. Credit will not be awarded for both ENVS 3315 and WSES 3315.

**ENVS 3323. Ethical Issues in Agriculture and the Natural Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will examine the several major ethical issues facing agriculture and natural resources sciences in our current society. Readings, discussions and lectures will focus on the scientific, capitalistic, and philosophical motivation in common ethical issues. Upon completion of the course, students will be able to construct and dissect ethical arguments and hopefully become more aware of the ethical dilemmas we all face each day. Can receive credit for WSES 3323, ENVS 3323 or ANSC 3323.

**ENVS 3375. Population, Pollution, and Resource Depletion. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles and philosophies associated with the development, management, and use of natural resources are studied in the relationship to the ecological and social implications inherent in management alternatives involving the natural environmental and the use of renewable natural resources. Can receive credit for either ENVS 3375 or WSES 3375. Prerequisite: Junior classification.

**ENVS 4084. Environmental Science Internship. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Formally arranged and approved on-the-job training with a cooperating sponsor in government or private sector of the environmental field. A minimum of 40 hours of training is required for each hour of academic credit. A maximum of six hours of credit may be earned. Oral and written reports of the experience are required. Prerequisite: advanced standing and approval of the instructor. Prerequisite: Junior or Senior classification and approval of the instructor.

**ENVS 4086. Environmental Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Independent study or research of current topics in student's major. Content and credit dependant on depth of study. May be repeated for credit subject to approval of program lead or department head as appropriate.

**ENVS 4088. Undergraduate Research. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Fundamental research methods will be addressed through a faculty-directed project. Participation in an abbreviated lecture series may be required. Project components may include a literature review, data collection and analysis, testing, planning, project design, and/or computer modeling. the student may be required to prepare a final report and produce a presentation. Prerequisites: approval of the instructor. Prerequsite: Approval of the instructor.

**ENVS 4185. Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A review of current problems and developments in environmental arena. Discussions of current literature and research. May be repeated once for credit.

**ENVS 4187. Environmental Science Capstone. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Integrate and use fundamental concepts learned in previous environmental science courses to research and analyze real-world environmental issues. Oral and written reports on experiential learning, supplemented by appropriate internet and multimedia materials.

**ENVS 4340. Environmental Science Field Study. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A field course involving visits to environmental science businesses, agencies, and organizations including TCEQ, watershed management organizations, river authorities, energy companies, and environmental advocacy organizations to learn about their work and engage in hands-on assessment activities. Requires an extended field trip at student's expense. Prerequisite: Grade of C or better in either WSES 2405 or BIOL 4401.

**ENVS 4390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**

**ENVS 5086. Environmental Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Independent research under the supervision of an instructor. A formal report will be submitted to the instructor. A student may not count more than 6 hours of Environmental Science problems toward a degree. Lab fee $10.

**ENVS 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisite: BIOL 5398 and consent of major professor.

**ENVS 5185. Graduate Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A graduate seminar with content varying according to the needs and experiences of students and the instructor of record. May be repeated for up to three hours credit as content varies.

**ENVS 5300. The Regulatory Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of local, state, national, and international regulatory agencies to include their organization and authority. Case studies of environmental problems and legislated regulations are covered.

**ENVS 5310. Environmental Geology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explores the physical controls geology imparts to the global ecosystem through systems analysis of geologic processes. Hydrologic processes, river system processes and restoration, energy resources, coastal systems, and karst systems are all potential topics explored. Credit for both ENVS 5310 and GEOL 5310 will not be awarded. Prerequisites: GEOL 1403 or consent of department head.

**ENVS 5320. Issues in Water Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide a broad introduction to the critical issues relating to the world's freshwater resources. Students will examine the occurrence, use, management, and conservation of water and water resources in the U.S. and the world. Students will develop an understanding of the history and current issues in water resources and the environmental problems and political response to these issues.

**ENVS 5325. Environmental Hydrology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the processes that govern the earth's hydrologic cycle such as precipitation, evaporation and transpiration, runoff, infiltration and ground water and an exploration of anthropogenic effects on the hydrologic cycle. Topics include land-atmosphere interactions, movement of water in subsurface environments, contaminant transport in groundwater systems, streamflow generation, surface-water flow dynamics, urban runoff and flood control.

**ENVS 5329. Applications of Geographic Information Systems in Environmental Science. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Environmental and natural resource applications of Geographic Information Systems. Introduction to spatial analysis and 3-D analysis. The availability and uses of digital resources. Prerequisite: EASC 2320. Lab fee $15.

**ENVS 5331. Advanced Meteorology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the Earth's atmosphere and processes within it. Topics include weather, climate, heating, adiabatic processes, precipitation types and formation, wind currents, geostrophic effects, prediction, and warnings. Historical events will be discussed in context of modern understanding.

**ENVS 5335. Watershed Modeling. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The course will explore commonly used watershed models that can be used in linking sources of pollutants to receiving waterbodies. The course will explore large watershed, streamflow, water quality, urban watershed, and agricultural watershed models. Information will include model calibration and evaluation techniques.

**ENVS 5341. Environmental Site Assessment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to Phase I and Phase II investigations, principles of siting and installation of monitoring wells, a review of sampling methods and sample design, and the use of water quality data to characterize subsurface contamination. Prerequisite Course(s): Hydrogeology or consent of Department Head.

**ENVS 5345. Advanced Oceanography. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An integrated study of our oceans from the physical, chemical, biological, and geological aspects. Theory reinforced by practical field experience. Include analysis of seawater components, the effects of pollutants, and the impacts of chemical processes on marine organisms, as well as studying the physical conditions and physical processes within the ocean such as waves, currents, eddies, gyres and tides; the transport of sand on and off beaches; coastal erosion; and the interactions of the atmosphere and the ocean.

**ENVS 5380. Research and Writing in Agriculture and Environmental Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Preparation of writing samples, technical reviews, and/or professional manuscripts related to various topics in agriculture or environmental science. Prerequisite: Approved research methodology course. Cross-listed with AGRI 5380.

**ENVS 5390. Topics in Environmental Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Scientific aspects of varied environmental topics, which may include waste disposal, wetlands, air pollution, energy, bioremediation, or watershed analysis. May be repeated for credit as topics vary. Prerequisites: 12 hours of science (including six hours of chemistry) or approval of department head.

**ENVS 5460. Applied Remote Sensing. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An introduction to the features and interpretation of remotely sensed images from airborne and satellite platforms. Formats of imagery will include radar, thermal, and multispectral. Focus on interpretation of images for various usages, including agriculture, forestry, geology, urban landscapes, and geography. Factors affecting acquisition of a variety of features will be discussed. Introduction to the theory of color sensing and interpretation is included. Lab fee: $2.

# Earth Science

## Courses

**EASC 2310. Earth Systems Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to the nature and evolution of the Earth, hydrosphere, atmosphere and Solar System. Prerequisite: PHYS 1302 and CHEM 1302, or instructor/department head approval. Enrollment in this course is restricted to Interdisciplinary Studies majors. Lab Fee $2.

**EASC 2451. Introduction to Geographic Information Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This is a cross-listed course with GEOG 2451 Intro to GIS. Basic concepts of design, planning and implementation of geographic information systems. Students will learn how to create, manipulate, project, and interpret geographic information. Students are encouraged to take GEOG 1451: Pre-GIS before this course. Lab fee: $2.

**EASC 3310. Geographic Information Systems for the Sciences. 3 Credit Hours (Lecture: 1 Hour, Lab: 5 Hours).**
Applications of geographic information systems in the geological, environmental, earth, and other sciences. Laboratory exercises will apply GIS programs to geological and environmental problems. Lab fee: $2.

**EASC 3320. Astronomy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of astronomical instrumentation and methodologies, a survey of the solar system, star evolution, cosmology and the origins of the universe, and a review of galactic types and histories. Theory reinforced by field experience. Prerequisites: GEOL 1403 and 1404 or approval of department head. Lab fee $5.

**EASC 3330. Meteorology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the Earth's atmosphere and the basic principles of weather analysis, climate and climatic controls, with emphasis on climatic effects on man. Theory reinforced by practical field experience. Prerequisites: GEOL 1403 or approval of department head. Lab fee $5.

**EASC 3340. Oceanography. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of our oceans from the physical, chemical, biological, and geological aspects. Theory reinforced by practical field experience. Prerequisites: GEOL 1403, 1404, junior classification or approval of department head. Lab fee $5.

**EASC 3350. Environmental Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Integration of existing knowledge of geological, hydrological, and environmental processes associated with environmental management and land-use planning issues; including discussions of surface and subsurface water quality and quantity, soil erosion, solid and liquid waste disposal and flooding. Case studies involving environmental impact analysis. Prerequisites: GEOL 1403, 1407; CHEM 1411, or approval of department head.

**EASC 3360. Remote Sensing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
An introduction to the feautres and interpretation of remotely sensed images from airborn and satellite platforms. Formats of imagery will include radar, thermal, and multispectral. Focus on interpretation of images for various usages, including agriculture, forestry, geology, urban landscapes, and geography Prerequisite: Junior classification Lab fee: $2.

**EASC 3370. Biogeography. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Geographical distribution of plants and animals. Explores the concepts of evolutionary change, allopatric and sympatric speciation, vicariance and dispersal and how these processes affect species distributions through time. Covers the effects of topography, physical, and climactic factors which affect species distributions. Combines data and discoveries from a variety of fields, including biology, paleontology, ecology, evolution, and geology. Lab fee: $2.

**EASC 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course open to capable Earth Science and Geology students. Topics may vary according to student need. May be repeated for credit, subject to the approval of the department head. Prerequisite: Approval of department head.

**EASC 4313. Environmental Techniques. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A survey of techniques used in environmental investigations focusing on sampling and geochemical methods important to the environmental industry. Topics to be covered may include topographic surveying, geochemical sampling in surface waters and groundwater, soil sampling and site characterization. Prerequisites: GEOL 1403, and MATH 1316, MATH 2412, or MATH 2413 or approval of department head. Lab fee $2.

**EASC 4384. Earth Science Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 8 Hours).**
Pre-approved and supervised work experience in an environmental or earth science position in industry or the public sector. Prerequisite: Junior classification and approval of department head. Field experience fee $50.

# Fine Arts

## Courses

**FINA 1360. The Art of Film. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview of the historical development of cinema (including contemporary and classic films) as an artistic and social force. Students study the aesthetic elements of the cinema, the terminology governing film production and the lines of critical inquiry that have been developed for the medium. Readings, screenings and written reports required.

**FINA 4085. Fine Arts Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Design of course will focus on current topics and issues in fine arts of interest to a group of students. May be repeated twice for credit as topic and/or objectives of the course change. Prerequisite: upper-level status only.

**FINA 4086. Individual Problems in Fine Arts. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
A course featuring independent reading, research, and discussion under personal direction of instructor. Topics vary according to student need. Prerequisite: approval of department head.

**FINA 4301. The Arts in Contemporary Society. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An interdisciplinary course which emphasizes the relationships of art, music, and theatre in contemporary society. Class projects and individual research assignments involve analysis and either written or oral reports. Prerequisites: Senior or advanced junior standing with 18 hrs in ARTS, MUSI, or DRAM/THEA or approval of department head.

**FINA 5386. Special Problems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Conference course. Independent reading, research, discussion under the supervision of an instructor. May be repeated as topic varies. Prerequisite: Full admission to the College of Graduate Studies or approval of department head.

**FINA 5390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Conference course. Independent reading, research, discussion under the supervision of an instructor. May be repeated as topic varies. Prerequisite: Full admission to the College of Graduate Studies or approval of department head.

# Fashion Studies

## Courses

**FASH 1301. Apparel Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Basic construction of textile items taught through lecture, demonstration, instructional media, and lab experience. No experience in clothing construction required. A grade of "C" must be earned to progress to FASH 2302. Lab fee: $2.

**FASH 1309. Fashion & Culture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the functions of fashion items in society. Includes cultural and environmental influences, communications, social, and psychological functions.

**FASH 1312. Pattern Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the design and construction of flat patterns, manually and using CAD. Includes making patterns for illustrated fashion designs. Lab fee $2.

**FASH 1313. Fashion Illustration. 3 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
Style, color, and good use of design principles and elements to produce fashion designs for specific clientele; development of a personal fashion illustrative style for professional presentation utilizing different media. Prerequisite: ARTS 1316, or approval of instructor or department chair. Lab fee: $2.

**FASH 2303. Technical Design Process. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Garment development and analysis of fit, performance, quality, and cost. Exploration of alternative fabrications, construction methods; specifications and portfolio development.

**FASH 2305. Advanced Apparel Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Investigation of fashion design through the process of research and development techniques currently utilized in the industry. Prerequisites: Completion of FASH 1301 with a C or better, or with permission of instructor or department head. Lab fee: $2.

**FASH 2306. Fashion Industry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory overview of the fashion industry and its scope, economic importance, and the role of the designer and the consumer.

**FASH 2338. Fabric Fundamentals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of fabrics, fibers, yarn development, fabric construction, and finishes; the newest fiber developments; selection and care of fabrics appropriate for apparel, costuming, and interiors.

**FASH 3301. Fashion History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of Western fashion development between pre-history and 1890's in the context of social, cultural, and economic environments.

**FASH 3309. Fashion Curation & Exhibitions. 3 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
Study of theories related to creating promotional spaces, exhibition spaces, and fashion shows. Learn the skills needed for acquisition and cataloging fashion items for an historic costume or theater costume collection. Prerequisites: ARTS 1316 & FASH 1313 or approval of the instructor or department head.

**FASH 3327. Comparative International Fashion. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analysis of trends, colors, fabrications, and apparel details in three international fashion centers. Through constructive analysis and creative thinking, students learn multiple aspects of comparative cultural aesthetics through fashion.

**FASH 3328. Apparel Development III. 3 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Exploration of couture and tailoring finishing techniques specific to hands-on applications of clothing construction taught through lecture, demonstration, instructional media, and lab experience. Prerequisite: FASH 2338 & 2302 or approval of instructor or department head. Lab fee: $2.

**FASH 3329. New Fashion Ventures. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Study of logistical market research, including location/media, target market, product, and auxiliary support necessary to be successful in a new fashion entity; includes internet opportunities. Prerequisite: FASH 2306 or permission of instructor or department chair.

**FASH 3337. Brand Management and Promotions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of brand development and management focused on experiential marketing, promotions, visual merchandising, design/layout of retail spaces, and software application.

**FASH 4086. Special Problems. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A opportunity for in-depth research, study away, study abroad, or special project leading to unique learning experiences for students majoring in fashion design. Can be repeated for a total of 9 hours. Registration permitted only by instructor or department chair. Prerequisite: Registration permitted only by instructor or department chair.

**FASH 4301. Modern Fashion. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of fashion evolution and fashion designers from 1890s to the present in the context of social, cultural, and economic environments. Prerequisite: FASH 3301 or permission of instructor or department chair.

**FASH 4302. Couture Techniques. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Development and execution of a collection for competition, exhibiting innovative design and finishing techniques. Prerequisite: FASH 2305 or approval of instructor or department chair. Lab fee: $2.

**FASH 4308. Fashion Forecasting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Analyses of current, past, and historic designers' annual fashion collections; development of projected styles, colors, and textiles for new collections in the coming seasons. Prerequisites: FASH 1309, 2306, & 4301 or approval of instructor or department chair.

**FASH 4383. Fashion Portfolio. 3 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
The capstone course. Professional development including the creation of a professional quality digital portfolio of design work as well as other media for seeking internships and entry-level positions. Prerequisites: Taken only in last semester before internship. Minimum Major GPA 2.5 & approval of instructor or department chair. Lab fee: $2.

**FASH 4384. Fashion Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Practical application, at least 400 work hours, utilizing theory and skills learned through coursework under the supervision of professionals in the fashion industry. Prerequisite: Minimum overall GPA 2.5 & approval of instructor.

**FASH 4391. Topics in Fashion Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An independent study of current topics in fashion design. A course contract will be required with expectations described. This course may be repeated for a maximum of 9 hours. Prerequisite: Registration is only with faculty or department chair approval.

# Family & Consumer Sciences

## Courses

**FACS 5086. Special Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
A problem selection course available to students who are capable of independent problem selection and development. Chosen problems will be approved in advance by the instructor. May be repeated for a maximum of six hours.

**FACS 5390. Advanced Topics in Family & Consumer Sciences. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced topics in Human Sciences requiring in-depth research and discussion. This course may be repeated for a maximum 6 hours as topics change.

# Food Science

## Courses

**FDSC 1307. Concepts and Controversies in Food Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Principles of food studies and exploration of the role food narratives and exposés play in the consumer's perception of the current food supply. Foundation for understanding the connections among food production, ecology, ethics, cuisine, nutrition and health within the framework of sustainability. Can receive credit for either FDSC 1307 or WSES 1307.

**FDSC 1316. Principles of Food Preparation. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Study of food, food composition, and scientific principles involved in food preparation. Can receive credit for either FDSC 1316 or NUTR 1316.

**FDSC 3304. Food Processing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The world food supply, trends and traditions in diet and food sanitation, safety, security, and biotechnology, and impact of processing on diet quality. Lab fee: $2.

**FDSC 3325. Advanced Meal Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Fundamentals of nutrition and food preparation in all types of meal service. Special emphasis is on time and money management. Credit will be given for only one of the following: WSES 3325, FDSC 3325, or NUTR 3325.

**FDSC 4335. Food and Culture. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
A study of the food beliefs and practices of the major ethnic and religious groups in the U. S. and the nutritional implications of these food practices, a cultural analysis of American food trends; ethnic issues and dietary changes; and research methods in food habits. Credit will only be given for WSES 4335 or FDSC 4335.

**FDSC 4407. Fermentation and Brewing. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
History of food safety, sanitation, fermentation, fermented foods, beer brewing, wine and cheese making, along with an introduction to industry organization; from commodities production, to processing, distribution, marketing, and sales. Hands-on instruction in small-scale brewing. Combines elements of science (chemistry, biology, and physics), economics, food preparation, aesthetics, preferences, and taste. Modest cost of field trips will be borne by the student. Credit will not be given for both WSES 4407 and FDSC 4407. Prerequisites: 8 hrs BIOL and 8 hrs CHEM; must be 21 years or age or older on the first class day to enroll in course.

**FDSC 4408. Sustainable Food Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Issues surrounding food production and the environmental and social impact of current food production systems. Emerging trends to increase the sustainability of food production, distribution, and consumption. Includes a laboratory field component and will require some field work outside normal class times. Credit will not be given for both WSES 4408 and FDSC 4408.

# Finance

## Courses

**FINC 3301. Principles of Financial Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An analysis of financial decision-making at the corporate level with emphasis on the maximization of stockholder wealth. Topics covered include financial statement analysis, the valuation of stocks and bonds, cost of capital, capital budgeting, dividend policy, leverage and capital structure, methods of firm valuation, working capital management, mergers and acquisitions, and bankruptcy. Prerequisites: ACCT 2301, ACCT 2302 and ECON 2301; or ACCT 3300 and ECON 2301.

**FINC 3302. Financial Intermediaries. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the internal operations of financial intermediaries with major emphasis on organization, source and allocation of funds, supervision, and regulation. Prerequisite: FINC 3301.

**FINC 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a Finance related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of department head.

**FINC 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in finance. May be repeated with approval department head. Prerequisite: Approval of the department head.

**FINC 4300. Advanced Financial Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced analysis of value-based management techniques with emphasis on the factors affecting the corporation's quest to maximize shareholder wealth. Topics covered include financial statement analysis, cash flow analysis, economic and market valued added, securities valuation, the cost of capital, capital budgeting, capital structure, dividend policy, the use of leverage, working capital management, and corporate governance. Prerequisite: FINC 3301.

**FINC 4301. International Financial Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Issues and questions which concern financial management of international corporations. Analysis of the financing of investment abroad and the management of assets in differing financial environments. The foreign investments decision, cost of capital and financial structure for multinational decision making, management of foreign subsidiary working capital, and financial control of multinational operations. Prerequisite: FINC 3301 or approval of department head.

**FINC 4302. Real Estate Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of monetary systems, primary and secondary money markets, sources of mortgage loans, federal government programs, loan applications, processes and procedures, closing costs, alternative financial instruments, equal credit opportunity acts, community reinvestment act, and state housing agency.

**FINC 4303. Case Studies in Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Capstone course requires students to use fundamental concepts learned in previous finance, accounting, and economics courses to analyze real-world finance problems. Using both structured and unstructured cases, student teams analyze problems and recommend solutions. Argument is presented both orally and in writing. Cases draw from such areas as corporate finance, investments, international finance, and personal finance. Prerequisite: FINC 3301.

**FINC 4304. Principles of Investments I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The development of investment policy; the character of investment risk; a comparison of investment media; description and analysis of security markets and their operations. Prerequisite: FINC 3301.

**FINC 4307. Investments II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course builds on Investments I, adding new assets (e.g. derivatives), new theoretical models (e.g. option valuation), and new techniques(e.g. hedging strategies). In addition, the course will cover asset management theories and measures. Prerequisite: FINC 3301, FINC 4304.

**FINC 4308. Principles of Insurance and Risk Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey course focusing on the theory and practice of private insurance and its economic and social significance. Major types of insurance are examined: life, health, automotive, homeowners, and liability. Various forms of risk management, characteristics of insurance contracts, government regulatory characteristics, and institutional structures are studied.

**FINC 4385. Seminar in Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of selected topics dealing with problems or unique needs of Finance. May be repeated for credit as topics vary. Prerequisite: Approval from department head.

**FINC 5086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
This course offers students the opportunity to become acquainted with current research being conducted within the student's area of interest; directed reading of a number of sources selected in concert by the student's professor. Prerequisite: Approval of department head.

**FINC 5301. International Finance and Business Strategy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course examines the major international issues pertaining to finance, including choosing and implementing an appropriate corporate strategy, the determination of exchange rates, international risk management, transfer pricing, and evaluating and financing international investment opportunities. There will be readings and case analysis and students will be required to report on research findings. Credit for both FINC 5301 and BUSI 5301 will not be awarded.

**FINC 5305. Case Studies in Corporate Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course designed to use case studies and financial analysis to further the graduate student's knowledge and ability to make financial management decisions. Selected cases will be assigned for outside the classroom analysis, and preparation of proposed solutions. The classroom will be used to discuss the cases, the student's proposal for solutions, and desired courses of action. The cases will be such that students will be required to use prior knowledge, current research, and a good deal of analytical ability in preparing their proposals. Prerequisite: Graduate standing.

**FINC 5306. Financial Markets and Institutions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is intended to give the student a broad coverage of the operation, mechanics, and structure of the financial system within the United States, emphasizing its institutions, markets, and instruments. Monetary policy of the Federal Reserve and its impact upon financial institutions are treated.

**FINC 5307. Financial Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Course focuses on financial decision making in the modern corporation. Basic issues include capital budgeting, capital structure, corporate sources of funding, dividend policy, financial risk management, standard theories of risk and return, and valuation of assets. Prerequisite: FINC 5300 or approval of instructor.

**FINC 5320. Health Care Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Health Care Finance offers an introduction to decision making in health care settings using accounting and finance theories, principles, concepts and techniques most important to managers. Credit for both FINC 5320 and ACCT 5320 will not be awarded.

**FINC 5335. Analysis of Financial Statements. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of financial statement analysis and accounting topics related to financial statement presentation and disclosure. Prerequisites: A background in both accounting and finance (at least leveling courses in both accounting and finance).

**FINC 5385. Seminar on Consumer and Business Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will cover selected consumer and business finance topics. Examples include debt management, initial public offering of a new business, Internet based finance and regulatory aspects, and management of compensation. Students will be expected to research assigned topics and submit reports.

**FINC 5390. Selected Topics in Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different topics in finance from areas such as investments, corporate financial management, and financial markets and institutions. This course may be repeated for credit as the topic changes. Prerequisites: Graduate standing and FINC 3301 or FINC 5307 or approval of instructor.

# French

## Courses

**FREN 1411. Beginning French I. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Instruction and practice in understanding and speaking the French language with stress on sentence structure, inflections, vocabulary, and pronunciation. Lab fee $5.

**FREN 1412. Beginning French II. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Instruction and practice in understanding and speaking the French language with increasing emphasis on reading and writing the language. Prerequisite: FREN 1411 or equivalent. Lab fee $5.

**FREN 2311. Intermediate French I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Development of increased facility in the French language through reading, writing, and conversation. Prerequisite: FREN 1412 or equivalent.

**FREN 2312. Intermediate French II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Readings in literature with emphasis on vocabulary building, writing, and comprehension. Prerequisite: FREN 1412 or equivalent.

**FREN 4386. Special Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course featuring independent reading, research, and discussion under personal direction of instructor. Topics vary according to student need. Open to students of senior classification or by approval of department head.

# Geography

## Courses

**GEOG 1303. World Regional Geography. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the basic concepts of geography through a study of the major regions of the world. This course enhances the understanding of world events, lifestyles, environments, cultures, and conflicts and emphasizes thinking spatially to study human-land relationships.

**GEOG 1320. Introduction to Human Geography. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to geography as a social science, emphasizing the relevance of geographic concepts to human problems.

**GEOG 1451. Pre-GIS: GPS, VGI and Cartography. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An introductory course to GIS. Pre-GIS focuses on the knowledge, instruments, and data necessary for GIS. Pre-GIS is a student-centered, hands-on course that will introduce students to the GIS concepts that are intrinsic in introductory and advanced GIS courses. Students will create virtual maps by gathering data points using GPS instruments. Students will then use GIS to create detailed information relating to their map and data points to answer questions posed in the course. Lab fee: $2.

**GEOG 2301. The Geography of Texas. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course uses the key concepts of regional geography to study the evolving character and nature of the different areas of Texas. The interaction of people and environment is used to study the economic development, social and political issues, urbanization, and other changes in Texas in the past and present.

**GEOG 2312. Economic Geography. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines economic activity and production as a function of geographic location. Introduces the basic concepts related to the advance, spread, and distribution of economic activity around the planet and considers the forces that are reshaping the global economy, the fundamentals of spatial economics, and classical location theories. Prerequisite: GEOG 1303 or permission of instructor.

**GEOG 2451. Introduction to Geographic Information Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Basic concepts of design, planning and implementation of geographic information systems. Students will learn how to create, manipulate, project, and interpret geographic information. Students are strongly encouraged to take GEOG 1451: Pre-GIS. Lab fee: $2.

**GEOG 3300. Geography of Latin America. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the physical and cultural regions of Latin America. The course will examine the Spanish and Portuguese divide, indigenous, Afro, Asian, and European influence within one the world's most vibrant regions. Prerequisite: GEOG 1303, or permission of instructor.

**GEOG 3301. Intro to Travel, Cultural Experience, & Study Abroad. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An introduction to travel and cultural experience, preparing students to maximize their perspective study abroad and international experiences. The course does not take students abroad, and the student does not need to be enrolled in a study abroad program to take this course.

**GEOG 3451. Advanced Geographic Information Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Advanced topics in geographic information systems (GIS), manipulation of raster data types; three-dimensional modeling; geoprocessing, and internet-based GIS modeling. Prerequisite: GEOG 2451 Lab fee: $2.

**GEOG 3452. GIS for Crime Analysis and Mapping. 4 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
This course teaches state-of-the-art GIS methods that will assist students in crime analysis and mapping. The course combines basic concepts in GIS and crime analysis methods and step-by-step lab exercises with independent assignments to teach key GIS skills, including data preparation and updating, map template building, map queries and analysis (including hot spot analysis), automation of map production, and predictive modeling skills. Students are strongly encouraged to take GEOG 1451 or GEOG 2451. Lab fee: $2.

**GEOG 4086. Geography Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**

**GEOG 4385. Geography Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will consider major issues in modern geography. May be repeated for credit when topics vary. Prerequisites: GEOG 1303, junior classification or permission of instructor.

**GEOG 4451. Applied Remote Sensing. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course focuses on advanced topics in satellite remote sensing and digital image processing. Students will learn how to processes, interpret, classify and analyze satellite data for different applications. Lab fee: $2.

**GEOG 4455. Spatial Analysis and Modeling. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course focuses on the use of GIS models and spatial data to explain patterns of human behavior and natural phenomena and their spatial expression on the landscape. It focuses on methods of spatial analysis and modeling that allow us to solve specific problems, and support important decisions using GIS hardware, software, and spatial data. Prerequisite: GEOG 1451, GEOG 2451 Lab fee: $2.

# Geology

## Courses

**GEOL 1100. Transitioning to University Studies in Geosciences. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
An introduction to geosciences, including earth science, environmental science, geology, hydrogeology, and petroleum geology. Practical study designed to prepare the geoscience student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process.

**GEOL 1403. Physical Geology. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An introduction to the physical processes that operate in and on the planet Earth. Topics of discussion include: the Earth's structure, rocks and minerals, volcanoes, earthquakes, groundwater, rivers, glaciers, and deserts. Lab fee: $2.

**GEOL 1404. Historical Geology. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
History of the Earth from the formation of the solar system to the present. Topics include the Earth's development, evolution of life on Earth, changes in the Earth's geography throughout its history, and the tools geologists use to investigate these topics. Lab fee $10.

**GEOL 1407. Introduction to Environmental Science. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to the study of the environment. The course will examine air, water, and soil pollution, and pollution remediation. Energy, mineral resources, and land use will be studied. The course will also emphasize a study of the water supply, water use, and water management. Much of the laboratory will focus on land use planning and environmental pollution remediation. Lab fee: $2.

**GEOL 1408. Natural Disasters. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Course focuses on the causes, effects, and mitigation of natural disasters around the world. Topics covered will include: plate tectonics, earthquakes, volcanoes, tsunami, landslides, meteor impacts, climate change, and major weather events such as tornadoes, floods, and hurricanes. Emphasis will be on methods used by scientists to monitor and study these natural phenomena, as well as the economic and societal impact of and response to the events. Lab fee: $2.

**GEOL 3310. Geomorphology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Study of surface processes in geological environments with emphasis on environmental and engineering applications. Topics include weathering, soil formation and erosion, landslides, and landforms associated with rivers, groundwater, coasts, arid and semi-arid climates. Laboratory emphasizes aerial photo and topographic map interpretation. Prerequisites: GEOL 1403. Lab fee $10.

**GEOL 3314. Geochemistry. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
A survey of the application of chemical principles to problems of geology. Topics include the origin and distribution of the elements and exploration of the behavior and distribution of various elements in igneous, metamorphic, and sedimentary rocks. Basic concepts of thermodynamics, solution chemistry, and isotope geochemistry will be discussed. Credit for both GEOL 3314 and CHEM 3314 will not be awarded. Prerequisite: CHEM 1412. Lab fee $10.

**GEOL 3320. Hydrogeology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Aquifer characteristics, physical principles of groundwater flow, well analysis, geologic controls on local and regional groundwater movement, water chemistry, groundwater pollution, legal issues in groundwater. Prerequisites: GEOL 1403, CHEM 1412, and either MATH 1316, or MATH 2412, or MATH 2413, or approval of department head. Lab fee: $2.

**GEOL 3400. Crystallography and Mineralogy. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the basic crystallographic forms, some of the common ore and rock forming minerals. An introduction to Optical Mineralogy. Prerequisite:GEOL 1403. Lab fee $2.

**GEOL 3405. Paleontology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An introduction to the study of fossils. A survey of the systematics, evolution and paleoecology of microfossils and important macrofossil groups. Prerequisite: GEOL 1403, GEOL 1404 Lab fee: $2.

**GEOL 3406. Igneous and Metamorphic Petrology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An introduction to the origin, characteristics, and associations of igneous and metamorphic rocks. Introduction to igneous phase diagrams and metamorphic phase equilibria. Prerequisite: CHEM 1411, 1412, GEOL 1403, MATH 1314 or higher. Course fee $50. Lab fee $10.

**GEOL 3412. Structural Geology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the forces and processes resulting in the deformation of and structural features of units in the Earth's crust. Lab work includes solution of problems by descriptive geometry, geologic and topographic maps and cross-sections. Prerequisites: GEOL 1403 and GEOL 1404 Lab fee: $2.

**GEOL 3413. Stratigraphy and Sedimentology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the origin, transportation, and deposition of sediments and the formation of sedimentary rocks. Emphasis on the study of strata and depositional systems and the utilization of sedimentology and stratigraphy in economic geology, environmental geology, hydrogeology and petroleum geology. Prerequisite: GEOL 1403 Lab fee: $2.

**GEOL 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course open to capable Geology and Earth Science students. Topics may vary according to student need. May be repeated for credit, subject to the approval of the department head. Prerequisite: Junior classification and approval of department head.

**GEOL 4305. Field Geology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An introduction to the identification and interpretation of rocks and geological structures in the field. Field and laboratory activities include rock identification and interpretation, surveying with plane table and alidade, measuring and describing geological sections and field mapping with brunton compass, air photos, and topographic maps. Prerequisite: GEOL 1403, and 6 hrs upper level GEOL. Lab fee $2.

**GEOL 4311. Economic Geology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
An introduction to the origin, classification, uses, and economics of metallic and nonmetallic mineral deposits. Lab will introduce reflected light microscopy, alteration petrology and simulate a complete mineral deposit exploration program. Prerequisite: GEOL 3406 or concurrent enrollment. Lab fee $10.

**GEOL 4312. Petroleum and Subsurface Geology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Origin and distribution of petroleum. Geochemistry and maturation of organic matter; microbiological and thermal degradation of hydrocarbons, conventional and unconventional petroleum systems; principles of primary and secondary migration; seals; hydrocarbon traps, diagenesis of carbonate and clastic reservoir rocks; use of subsurface geologic data to prepare maps and identify prospects. Prerequisite: GEOL 3312, 3413. Lab fee:$2.

**GEOL 4315. Sedimentary Petrology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Introduction to the physical, chemical, and biologic properties of sedimentary rocks, as revealed by petrographic microscopy, geochemical techniques, and field study. Emphasis is placed on the mineralogy, chemistry, textures, and sedimentary structures that characterize sedimentary rocks, and the relation of these features to their depositional origin and subsequent diagenesis. Prerequisites: GEOL 1403 and GEOL 3413 Lab fee: $2.

**GEOL 4316. Well Log Analysis. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Petrophysics and modern well-logging methods. Theory and applications of measurements of physical properties of the formation near the well bore, types of well logging tools, interpretation and use of well log information in petroleum exploration and development Prerequisite: GEOL 3413 Lab fee: $2.

**GEOL 4317. Seismic Interpretation. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Examination of seismic interpretation methods with emphasis on the petroleum industry. Topics include basic reflection theory, seismic acquisition and processing (prestack and poststack), incorporation of well data, picking and mapping horizons, structural interpretation, seismic stratigraphy, advanced seismic interpretation techniques, Direct Hydrocarbon Indicator (DHI), and depth conversion. Hands-on interpretation using standard industry software. Prerequisite: GEOL 3312, GEOL 3413. Lab fee: $2.

**GEOL 4318. Plate Tectonics. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Plate Tectonics is the unifying theory in modern geology. This course will examine the driving mechanisms of crustal deformation, geophysical and geologic data supporting sea-floor spreading and plate motions, and major type of plate boundaries. We will explore implications of plate tectonics, continental drift, and mountain building, the role of plate tectonic cycle in renewal of Earth's surface, and relation with other geochemical cycles. Readings from original papers. Prerequisite: GEOL 1403, GEOL 3413, Geol 3312 Lab fee: $2.

**GEOL 4320. Paleoecology. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The ecology of ancient life. The course will focus on defining and identifying community structures through time, exploring the rise and fall of communities and the changing populations within them. Emphasis will be on field and hand-sample identification of community affinities based on sediments and life habit. Prerequisite: GEOL 1404, GEOL 3405, GEOL 3413 Lab fee: $2.

**GEOL 4600. Field Camp. 6 Credit Hours (Lecture: 0 Hours, Lab: 12 Hours).**
Field course practicing field application of geological techniques. Locations visited and material covered vary by year and host institution. Methods practiced include: field mapping, data collection, measurement of sections, and geologic reporting. Prerequisite: Vary by institution. Lab fee: $2.

**GEOL 5086. Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Independent research under the supervision of an instructor. A formal report will be submitted to the instructor. A student may not count more than 6 hours of problems toward a degree.

**GEOL 5088. Thesis. 1-6 Credit Hours (Lecture: 6 Hours, Lab: 6 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until thesis is completed. Student must have submitted approved thesis proposal before taking for credit.

**GEOL 5100. Geology Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A graduate seminar course providing the opportunity for students to lead discussions on a current topic in Geology. Topics vary according to interests of faculty and/or students. May be repeated for credit as topics vary.

**GEOL 5400. History of Geology. 4 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the development of geological concepts and their impact upon science and society. Biographical as well as contemporary readings will be involved, investigating the confluence of geological science development with historical and societal factors.

**GEOL 5401. Crystal Chemistry. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An advanced study of the atomic or molecular arrangement of minerals. Topics covered would include, crystal structure, P-T phase diagrams, solid solution, exsolution, diffusion, atomic site occupancy, mineral chemical bonding, and the relationship of crystal structure to optical and physical properties. Lab fee: $2.

**GEOL 5402. Igneous Petrology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An advanced study of the origin of igneous rocks. The course would focus on geochemical aspects of igneous rocks, with a special emphasis on process such as fractionation, assimilation and liquid immiscibility. The course would involve an in-depth study of phase diagrams. Lab fee: $2.

**GEOL 5403. Metamorphic Petrology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An advanced study of the origin of metamorphic rocks. The course would focus on mineral chemical reactions occurring during metamorphism. Topics in the course would include thermodynamics, and in-depth study of phase diagrams. Lab fee: $2.

**GEOL 5404. High Temperature Geochemistry. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of the chemistry involved in igneous and metamorphic processes. The course would emphasize trace elements, stable isotope systematics, and radioactive isotopic systems. Lab fee: $2.

**GEOL 5405. Low Temperature Geochemistry. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A study of surface chemical systems. This course is sometimes called the geochemistry of natural waters. The course would focus on the chemistry of weathering and sediment deposition. Topics could include acidity and oxidation (EH-pH), stable isotopes, evaporate chemistry, clay chemistry, and aqueous system chemistry. Lab fee: $2.

**GEOL 5410. Field Paleoecology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The ecology of ancient life. The course will focus on defining and identifying community structures through time, exploring the rise and fall of communities and the changing populations within them based on field identification, utilizing sediments and life habit. Lab fee: $2.

**GEOL 5420. Ichnology. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Study of Trace Fossils. Course will focus on identification and description of ichnotaxa, ichnofacies, and ethological classifications. Field application of course content will be a major component. Lab fee: $2.

**GEOL 5430. Paleontological Data Analysis. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Study and application of statistical and multivariate techniques used in classifying and differentiating organisms, taphonomics, orientations, and ecologies. Methods covered will include DCA, PCA, PCO, NMDS, and Parsimony Analysis, as well as basic statistical methods. Lab fee: $2.

**GEOL 5450. Geomechanics and Fracture System Analysis. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Mechanical analysis of stress and strain within the Earth's brittle crust. Major topics include analysis of present day stresses, Anderson stress classification, overpressure, mechanical properties of rock, Mohr failure envelopes, and critical stresses on faults. Characterization and quantification of natural fracture systems will be a major component of the course. Lab fee: $2.

**GEOL 5451. Geometric and Kinematic Analysis of Structures. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Analysis of concentric folds of layered sedimentary rocks and fault-related folds with emphasis on geometric relationships. Introduction to quantitative models based upon geometric relationships between fault geometry, rheology, and fault slip rate. Techniques will be presented to incorporate surface and subsurface data to construct viable, admissible structural cross sections while minimizing artificial distortion. Modern structural software will be used. Techniques will be presented for reconstructions and restorations of cross sections. Use of growth strata to constrain the kinematic pathway of both compressional and extension folds and fault-related folds. Lab fee: $2.

**GEOL 5452. Seal and Trap Analysis. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Examination of the geological and physical processes that trap hydrocarbons in the subsurface and techniques for the evaluation of seal competency. Lab fee: $2.

**GEOL 5453. Structural Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Examination of extensional, compressional, and strike-slip systems from a tectonic and regional scale. The course will examine both kinematic and dynamic analysis of systems of associated structures. Emphasis will be on understanding key components and architectural elements of structural styles. Investigation of the mechanical and rheological controls on formation of structural regimes. Lab fee: $2.

**GEOL 5460. Sequence Stratigraphy. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Fundamental concepts of sequence stratigraphy applied to both carbonate and clastic systems. Integration of surface and subsurface data with an emphasis on petroleum exploration. Field trips required. Prerequisite: GEOL 3413 or equivalent with a grade of "C" or better Lab fee: $2.

**GEOL 5461. Carbonate Petrology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to the physical, chemical, and biologic properties of carbonate rocks, as revealed by petrographic microscopy, geochemical techniques, and field study. Emphasis is placed on the mineralogy, chemistry, textures, and sedimentary structures that characterize carbonate rocks, and the relation of these features to their depositional origin and subsequent diagenesis. Prerequisite: GEOL 3413 or equivalent with a grade of "C" or higher Lab fee: $2.

**GEOL 5462. Clastic Petrology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to the physical, chemical, and biologic properties of clastic rocks, as revealed by petrographic microscopy, geochemical techniques, and field study. Emphasis is placed on the mineralogy, chemistry, textures, and sedimentary structures that characterize carbonate rocks, and the relation of these features to their depositional origin and subsequent diagenesis. Prerequisite: GEOL 3413 or equivalent with a grade of "C" or higher Lab fee: $2.

**GEOL 5463. Clastic Depositional Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Clastic facies analysis and depositional environments: modern and ancient alluvial, lacustrine, desert, deltaic, estuarine, shoreline, shallow marine shelf and deep marine environments. Field trips required. Prerequisite: GEOL 3413 or equivalent with a grade of "C" or better Lab fee: $2.

**GEOL 5464. Carbonate Depositional Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Carbonate facies analysis and depositional environments; examination of both modern and ancient carbonate environments. Field trips required. Prerequisite: GEOL 3413 or equivalent with a grade of "C" or better Lab fee: $2.

**GEOL 5465. Basin Analysis. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Analysis of sedimentary basins, including their structural development, subsidence histories, thermal maturation, stratigraphy and depositional systems, and petroleum systems. Prerequisites: GEOL 3413 and GEOL 3312 (or equivalents) with a grade of "C" or better Lab fee: $2.

# German

## Courses

**GERM 1411. Beginning German I. 4 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Instruction and practice in understanding and speaking the German language with stress on sentence structure, inflections, vocabulary, and pronunciation. Lab fee $5.

**GERM 1412. Beginning German II. 4 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Instruction and practice in understanding and speaking the German language with increasing emphasis on reading and writing the language. Prerequisite: GERM 1411 or equivalent. Lab fee $5.

**GERM 2311. Intermediate German I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Development of increased facility in the German language through reading, writing, and conversation. Prerequisite: GERM 1412 or equivalent.

**GERM 2312. Intermediate German II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Readings in either literary or technical German with emphasis on vocabulary building, writing, and translation skills. Prerequisite: GERM 1412 or equivalent.

**GERM 4686. German Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
A course featuring independent reading, research, and discussion under personal direction of instructor. Topics vary according to student need. Open to students of senior classification or by approval of department head.

# Government, Legal Studies, and Philosophy

## Courses

**GLSP 1100. Transitioning to University Studies in Government, Legal Studies, and Philosophy. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of cultural awareness perspectives and opportunities to explore diversity. The course will also introduce students to the Government, Legal Studies, and Philosophy department.

# Government

## Courses

**GOVT 2305. Federal Government (Federal Constitution and Topics). 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the American national governmental system. This course with POLS 202 satisfies the legal requirement for graduation from state colleges and universities.

**GOVT 2306. Texas Government (Texas Constitution and Topics). 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the constitution of the state of Texas and of the state and local governmental units created by the constitution. This course satisfies the TEA requirement for out-of-state teacher certification and, when taken with GOVT 2305, the legal requirement for graduation from state colleges and universities.

# General Studies

## Courses

**GSTU 3398. Career Skills. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is the prerequisite to the General Studies Capstone course (GSTU 4398) and focuses on developing core skills to prepare students for their respective future careers. The course will teach interview skills, resume writing, research methods, teamwork skills, personal marketability, and communication skills. For General Studies majors.

**GSTU 4398. General Studies Capstone Course. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course requires students to integrate and use fundamental concepts learned in previous courses within the students' degree concentrations including research and analysis of real-world phenomena and problems. Students will work in teams, and students will present written reports on their research, supplemented by appropriate internet and multimedia materials, as well as portfolios documenting their research. This is a writing intensive course for General Studies majors. Prerequisite: GSTU 3398, approved degree plan for Bachelor of Science in General Studies program.

# Home Economics

## Courses

**HECO 1322. Nutrition and Diet Therapy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
(TCCNS = HECO 1322 or BIOL 1322) A study of the essential nutrients, including nutrient functions, food sources, deficiency symptoms, and toxicity symptoms; the nutritional requirements of individuals throughout the life cycle; the effects of nutrition on health and fitness; nutrition fads and controversies; and evaluation of personal eating habits. Prerequisite Course(s): One semester of chemistry is recommended.

**HECO 1325. Housing and Interior Design I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
(TCCNS = HECO 1325) Factors influencing design selection with emphasis on the fundamental structure and decorative qualities of design, psychological approach to color, and creative problem-solving.

**HECO 1328. Clothing Selection, Design and Construction. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
(TCCNS = HECO 1328) Principles of clothing construction taught through lecture, demonstration, instructional media, and hands-on laboratory experience. Students are required to construct personal garments and to produce samples illustrating various construction techniques. Lab fee $15. Prerequisite Course(s): FCSC 1201: Basic Clothing Construction.

**HECO 2311. Fashion Merchandising. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
(TCCNS = HECO 2311) An introductory overview of the fashion business and its scope, economic importance, and marketing practices. The power of fashion and the role of the ultimate consumer are also addressed. Field trips may be required.

# History

## Courses

**HIST 1301. United States History I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a survey of United States history from the first European contacts through the end of the Reconstruction Period. It is designed to cover the broad sweep of United States political, cultural, social, and economic history with emphasis on those periods that have helped to shape a distinctive American character. This course with HIST 1302 will fulfill the legislative requirement of two semesters of United States history.

**HIST 1302. United States History II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course continues the survey of United States history to present times. The emphasis is on the developments that contributed to the growth of modern America. This course with HIST 1301 will fulfill the legislative requirement of two semesters of United States history.

**HIST 2321. World Civilizations I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of world history from prehistoric times to the beginning of the 18th century. Special attention will be given to the origins of civilization in Africa, Asia, and the Middle East and its development through the ancient, medieval, and early modern eras.

**HIST 2322. World Civilizations II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of world history from the beginning of the 18th century to the present. Special emphasis will be placed on the rise and fall of Western global influence between the 18th and 20th centuries, and the numerous repercussions of this development.

**HIST 3302. The Ancient World. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the ancient Near East, Greece, the Hellenistic period, and the Roman Republic and Empire. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of the department head.

**HIST 3303. Europe in the Middle Ages. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of Medieval Europe from the decline of the ancient world to the eve of the Renaissance. Special attention will be given to the examination of economic and social changes underlying the formation and development of medieval civilization. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3304. History of Texas. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of Texas from the Spanish colonial period to the present, with special attention to the Hispanic heritage, the Revolution and Republic, the Civil War and Reconstruction, and the political and economic developments of the modern state. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3305. England and Great Britain to 1603. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of English history from Roman Britain to the death of Queen Elizabeth and the end of the Tudor dynasty. Special emphasis will be in political, legal, and religious changes which formed the foundations of modern England. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 3306. British History from 1603 to Modern Times. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of English and British history from 1603 to modern times. Special emphasis will be on constitutional, political, economic, and legal changes. Included as well will be a survey of the empire and the United Kingdom. Prerequisite: 6 hours HIST or approval of department head.

**HIST 3309. History of Christianity and Christian Thought to the Reformation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An overview of the history of Christianity and Christian thought from founding to the beginnings of the Reformation with particular attention to major themes, movements, events, leaders, and developments within their social, cultural and political contexts. The course also offers an introduction to the central ideas and debates that have shaped the historical development of Christian theologies, practices, and institutions. Credit will not be awarded for more than one of the following courses: PHIL 3309, HIST 3309, and RELI 3309. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3310. Colonial America. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This writing intensive course tracks the history of North America from first contact between American Indians, Europeans, and Africans to 1800. The course emphasizes research into the primary and secondary sources relevant to European-Indian relations; imperial and intertribal rivalries; the emergence of slavery and plantation societies; and the development of the Spanish, English, Dutch, and French mainland colonies. Each student will complete a rigorous original research project that examines this history. Prerequisites: HIST 1301 and 1302; 3340 as prerequisite or concurrent course, which is already an extant expectation.

**HIST 3311. Creating a Nation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The United States from 1763 to 1815. The course concentrates on the causes and consequences of the American Revolution, the creation of the Constitution, the role of slavery, and the tumultuous political and social events of the young republic. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 3312. A Nation Divided, 1815-1860. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The United States from 1815 to 1860. An era shrouded in myth and legend, the early decades of the 19th century saw dramatic changes in American technology, politics, religion, economics, and society. From railroads, reforms, and religion, to political parties, Old Hickory, and the Cotton Kingdom, antebellum America was an exciting and critical time. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3313. Civil War and Reconstruction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The United States from 1850 to 1877. From the infamous "Compromise of 1850" through the notorious "Compromise of 1877," this course will cover the immediate causes of disunion, the military and political battles of the Civil War, and the turbulent, controversial era of Reconstruction. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3315. Rise of Industrial America, 1877-1929. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The United States from 1877 to 1929. In the years following the Civil War and Reconstruction, the nation experienced dramatic economic and social changes. An era made famous by Big Business, Robber Barons, corruption, and the Roaring Twenties, this period also saw the birth of a global American Empire, the rise of Populist and Progressive reformers, and the development of conditions that would lead to the Great Depression. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3317. U.S. Military History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the beginnings and growth of the American military tradition from the first English colonies through the new challenges of the 20th Century requiring changes and growth in the American military tradition. Important battles will be considered, especially those that illustrate tactical and technological developments. The primary emphasis of the class, however, will be on policy and strategic thought. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or department head approval; the HIST 3340 prerequisite is waived for Military Science students.

**HIST 3320. The Renaissance and Reformation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A survey of European political, diplomatic, and cultural history from 1300 to 1648. The course will focus on Renaissance Humanism, the Protestant movements, the Catholic Reformation, and the emergence of the European state system during the age of religious wars. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 3321. Europe in the Age of Absolutism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the European state system from the end of the Thirty Years War to the outbreak of the French Revolution. The course will concentrate on the consolidation of absolute monarchies, the rise of colonial empires, enlightened despotism, and the proliferation of Enlightenment ideas in Europe. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of Department Head.

**HIST 3322. Revolutionary Europe 1789-1850. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the forces of change in modern Europe, beginning with the rise of Liberalism in the eighteenth century and culminating with the failure of the revolutionary movements of 1848-49. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 3323. Women and Gender in U.S. History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines shifting conceptions and experiences of gender in the United States from the colonial period through the present. Topics to be covered include changing notions of masculinity and femininity; race, ethnicity, and sexual politics; the long struggle for women's rights; shifting family patterns; the media and popular culture; labor and the workplace; and the culture wars. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3332. Latin America After Independence. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course on the history of Modern Latin America will discuss the American global hegemony, conflicts among civilizations, North and South separation, and Latin American influence in the Hispanic world. Prerequisites: 6 hours and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 3335. History of Mexico. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A survey of the political, economic, social, and cultural history of Mexico that includes pre-Columbian civilizations, especially the Maya and Aztec, the Spanish colonial era, and the national period. Prerequisites: 6 hours of HIST and HIST 3340 (this course can also be taken concurrently), or permission by department head.

**HIST 3340. Historical Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An examination of the concepts basic to all historical thinking; causation, periodization, change and continuity, the roles of social forces and individuals, and problems of interpretation, accuracy, and truth. A comparison of the social sciences and the humanities will focus on the distinctive nature of the historical discipline as it has developed since the late nineteenth century. Required of all history majors and students with teaching fields in history. Prerequisite: 12 hours of HIST or permission of department head.

**HIST 4085. History Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Individual instruction in selected fields of history. The course will stress reports and wide readings in the field selected. Prerequisites: Senior classification and HIST 3340, or approval of department head. May be taken more than once for credit.

**HIST 4086. History Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Independent reading, research and discussion. Entry into this course will be arranged with a history faculty advisor. Prerequisite: HIST 3340 or permission of department head.

**HIST 4300. World War II and the Holocaust. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of European history between the end of the First World War to the aftermath of World War II. Special attention will be devoted to the rise of Hitler in the early 1930s and the origins, process, and consequences of the Holocaust. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 4301. United States and the World. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A history of how world events influenced American history from 1789 to the present. The course will discuss American diplomatic and social reactions to major world occurrences. Emphasis will be on the twentieth century, particularly on the two world wars and the Cold War era. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 4303. History of the American Borderlands. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This class examines the history of the North American borderlands from the sixteenth century to the present. It takes a comparative approach, examining the history of the US-Mexico and US-Canada borderlands in relation to one another. We will address several key themes, including the establishment of formal legal regimes in the borderlands; changing notions of citizenship; immigration policies and experiences; intercultural and interracial communities and tensions; the rise of border cities as sites of tourism and ‘sin’; Texas as a border state; crime and smuggling along the borderline; representations of the border in media and popular culture; and the political and economic relationships between the United States, Mexico, and Canada. Prerequisites: HIST 1301, HIST 1302, and HIST 3340.

**HIST 4305. Ideas in Action: American Social Thought from the Progressive Era to the Present. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This reading and writing intensive seminar offers students the opportunity to encounter the ideas that have been cornerstones of intellectual debate in the United States since the late 19th century. From the Pragmatists (and the progressive era) to the neoconservatives of the more recent past, ideas have been embedded within the more available world of policy, politics and major historical developments. Participants in this course will survey a wide array of intellectual debates that have been essential components of American history. HIST 4301 is recommended. Prerequisites: HIST 1301, 1302, and 3340.

**HIST 4307. History Careers Outside the Classroom. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of the choices available for historians who seek careers outside of classroom teaching, including museums, historic preservation, cultural resource management, archival administration, parks, oral history, corporate history, and editing and publishing. Will not count as a history course for purposes of teacher certification. Prerequisites: 6 hours of HIST and HIST 3340 (this course can also be taken concurrently), or with permission of department head.

**HIST 4310. Recent United States History, 1929-Present. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will cover the period of American history that stretches from 1929 to the present. Discussions of the diplomatic and the domestic realms will be intertwined, illustrating how each component influenced the other. On the diplomatic side, emphasis will be placed on the rise of the United States to world power status and how the country responded to the responsibilities that accompanied that position. Domestically the course will focus on the nation finishing its transformation from a rural society to an urban one. Emphasis will be placed on the role of and attitudes toward the federal government. Considerable attention will also be directed toward the nation's continued struggle to deal with its diversity. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 4311. Research in American Political History since 1929. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This writing intensive seminar offers students the opportunity to encounter vital American political history developments since 1929. All students will carry out extensive reading and research in primary and secondary resources. Those sources will have direct relevance to the research project the student pursues. Topics for the semester’s research will vary based upon instructor prerogatives. Completion of HIST 4310 is recommended. Prerequisites: HIST 1301 and 1302; HIST 3340 or permission by the instructor or department head.

**HIST 4312. Social History of the United States Before 1865. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The social, cultural, and economic development of the United States from colonial times to the end of the Civil War. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 4313. Social HIstory of the United States Since 1865. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The social, cultural, and economic development of the United States since the Civil War. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 4314. History of the Trans-Mississippi West. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
History of the Great West from the Lewis and Clark expedition to the 20th century. Emphasis on the West as a distinctive region in national politics, state building in the 19th century, and the development of agriculture, transportation, and commerce. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 4315. Slavery and the American South. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
From English pirates in the 1610s to King Cotton in the 1830s to the Civil War in the 1860s, this course will explore the nuances of Southern culture, politics, and economics, as well as the evolution and patterns of American slavery. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 4320. Europe 1850-1919. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An analytical survey of important developments in the political, social, economic, and cultural history of Europe between the revolutionary movements of 1848 and the first World War. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 4324. National Histories. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Each time this course is offered, it will examine the history of a particular state. May be repeated for credit when topics vary. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or approval of department head.

**HIST 4325. European Intellectual and Cultural History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of some of the fundamental ideas in the European intellectual tradition from the Renaissance to the contemporary age. The course focuses on the ideas and ideologies that have shaped modern European mentalities through an analysis of primary texts. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 4331. World Since 1919. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Major trends in world history following World War I, including the impact of the Great Depression, the rise of fascism, World War II and its impact, the Cold War, decolonization, and the rise and fall of the Soviet Union. Events of the latter 20th century receive special emphasis. Prerequisites: 6 hours HIST and HIST 3340 (this course can also be taken concurrently), or permission of department head.

**HIST 4350. Special Topics in History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of important periods, regions, and themes in history. May be repeated when the topic varies. Prerequisites: 6 hours of HIST and HIST 3340 (this course can also be taken concurrently), or permission by department head.

**HIST 4384. Practicum, Field Problem or Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in workplaces where historians find professional careers including museums, historic preservation, cultural resource management, archival administration, teaching, parks, oral history, corporate history, and editing and publishing. Will count as an elective but not for teacher certification or completion of the history major. Prerequisites: 6 hours of HIST, HIST 3340, and HIST 4307. May be repeated once for credit.

**HIST 4390. History Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course requires students to synthesize knowledge and apply concepts and skills acquired in previous history courses. Students will identify a research question, consult relevant primary and secondary sources, analyze those sources, formulate an interpretation, and write a paper to communicate their conclusions. The topic of the Capstone will change every semester and will be determined by the instructor. Preferably, students will take this course in the last semester of their senior year. Prerequisites: HIST 3340 and senior status.

**HIST 5086. History Problems. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Conference course. Independent reading, research, discussion, under supervision of senior professor.

**HIST 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: 24 hours graduate credit, including HIST 5398 and at least one research seminar, and consent of major professor.

**HIST 5307. Public History Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of public history careers available for master's level history graduates in areas outside of classroom teaching. This is a gateway course for all public history courses.

**HIST 5308. Museum Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the theory and practice of the multiple careers available to historians in museums, including curating, collections care, educational programming, exhibits, media relations, financial development, and construction and management of facilities. Course fee $50.

**HIST 5309. Historic Preservation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of historic preservation as an area of professional employment for historians. Course fee $50.

**HIST 5310. Archival Principles and Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the principles and practices of archival management. Course fee $50.

**HIST 5320. State and Local history. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected problems. Readings and research in Texas history. May be repeated when topics vary.

**HIST 5331. Directed Reading in American History Since 1877. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Readings and discussions of selected problems. May be repeated for credit when topics vary.

**HIST 5332. Selected Topics in American History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Research and writing of papers on selected topics. May be repeated for credit when topics vary.

**HIST 5340. Directed Readings in European History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Readings and discussions of selected topics in early modern and modern European history. May be repeated for credit when topics vary.

**HIST 5342. Selected Topics in European History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Research and writing of papers on selected topics. May be repeated for credit when topics vary.

**HIST 5343. Directed Readings in World History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Readings and discussion of selected topics in the history of regions and countries outside of Europe and the United States. May be repeated for credit when topics vary.

**HIST 5398. Historiography and HIstorical Method. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of various "schools" of history with particular emphasis on recent trends and techniques in historical writing. Prerequisite: Full admission to the graduate program or permission of instructor.

**HIST 5399. Practicum, Field Problem or Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in workplaces where historians find professional careers including museums, historic preservation, cultural resource management, archival administration, teaching, parks, oral history, corporate history, and editing and publishing. Will count as an elective but not for teacher certification or completion of the history major. May be repeated once for credit. Requires approval of instructor and department head. Field experience fee $50.

# Histology Technician

## Courses

**HLAB 100. Research Histotechnology Wrksh. 2 Credit Hours (Lecture: 0 Hours, Lab: 0 Hours).**

**HLAB 2182. Introduction to Medical Labratory Sciences. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
An introductory course in medical laboratory science. Universal lab safety practices, computer applications for science and medicine, basic lab mathematics, quality control and basic laboratory equipment including microscopy, centrifugation, analytical weighing and other laboratory equipment common to all medical laboratories. This course must be taken during the first semester of enrollment in the HT/MLT certification programs. Lab Fee: $2.

**HLAB 2285. Capstone Cases and Review. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Major theoretical and practical applications in histotechnology including preparation of staining portfolio, mock registry exam (program final) and attendance at pathologist case presentations. This course must be taken during the final semester of enrollment in the HT program. Lab Fee $2.

**HLAB 2334. Functional Histology I. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
Cellular Histology; Emphasizes the recognition, composition, and function of cells, cellular organelles, cell life cycles, blood and basic tissue types. Lab Fee: $2.

**HLAB 2335. Histotechnology III. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
Histotechniques: Special Staining; Theory and practice of histochemical staining techniques, including microorganism, tissue pigments, minerals, and neural tissue staining. Includes specialized techniques such as electron microscopy, immunohistochemistry, and muscle enzyme histochemistry. Lab Fee $2.

**HLAB 2414. Introduction to Histotechnology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduction to the healthcare environment and histology laboratory with emphasis on safety; infection control; mathematics; communication; medical terminology and ethical, legal and professional issues. Lab Fee $2.

**HLAB 2415. Histotechnology I. 4 Credit Hours (Lecture: 2 Hours, Lab: 6 Hours).**
Histotechniques: Tissue Processing; Introduction to basic theories and practices of histotechnology including laboratory safety, fixation, tissue processing, embedding, microtomy, routine staining and operation and maintenance of lab equipment. Lab Fee $2.

**HLAB 2424. Functional Histology II. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This anatomic histology course emphasizes the recognition, composition and function of organ systems including skeletal, nervous, circulatory, endocrine and reproductive system tissues. Lab Fee: $2.

**HLAB 2425. Histotechnology II. 4 Credit Hours (Lecture: 2 Hours, Lab: 6 Hours).**
Histotechniques: Theory and practice of histochemical staining techniques. Topics include reagent preparation, basic tissue dye bonding, differentiation, quality control, nuclear, connective tissue and carbohydrate staining techniques. Lab Fee $2.

**HLAB 2495. Clinical Histotechnology I. 4 Credit Hours (Lecture: 0 Hours, Lab: 15 Hours).**
An introductory histology laboratory-based learning experience that enables students to observe and apply theory, skills, and concepts. Direct supervision is provided by the clinical professional. This course must be taken during the first semester of the HT program. Field Assignment Fee: $50.

**HLAB 2496. Clinical Histotechnology II. 4 Credit Hours (Lecture: 0 Hours, Lab: 15 Hours).**
An intermediate histology laboratory-based learning experience that enables students to apply theory, skills, and concepts. Direct supervision is provided by the clinical professional. Course must be taken during the second semester of the HT program. Field Assignment Fee: $50 Prerequisite: HLAB 2495.

**HLAB 2497. Clinical Histotechnology III. 4 Credit Hours (Lecture: 0 Hours, Lab: 15 Hours).**
An advanced histology laboratory based learning experience that enables students to apply and integrate theory, skills, and concepts and to work independently. Direct supervision is provided by the clinical professional. This course must be taken during the last semester in the HT program. Prerequisites: HLAB 2495, HLAB 2496; Field Assignment Fee: $50.

# Honors

## Courses

**HNRS 1185. Freshman Honors Seminar. 1 Credit Hour (Lecture: 1.5 Hour, Lab: 0 Hours).**
Discussion and argumentation about a topic of broad intellectual, academic, ethical, or public significance. Topics and content vary. Prerequisites: acceptance into Presidential Honors Program or permission of the director of the Presidential Honors Program.

**HNRS 2385. Honors Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**

**HNRS 3385. Honors Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This is a course which stresses a reflective and critical approach to a topic of broad intellectual, academic, ethical, or public significance. Topics and content vary. Prerequisites: acceptance into Presidential Honors Program or permission of the director of the Presidential Honors Program.

# Horticulture

## Courses

**HORT 1301. Horticulture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the horticulture industry and the career opportunities that are available. The course includes an introduction to plant classification and structure, greenhouse construction and management, orchard and vegetable crops, and plant propagation.

**HORT 2320. Sustainable Horticultural Practices. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Introduction to gardening with a focus on using sustainable methods. Crop choice by season, soil fertility and weed, insect and disease identification and management using conventional and organic practices. Basic landscape design and management. Effects of organic and non-organic practices on the garden ecosystem. Students practice growing a garden using the techniques discussed in lecture. Home landscaping, container gardens, bonsai, herbs and medicinal plants and hobby greenhouse management. In addition to receiving class credit, students will be eligible to complete 50 hours of documented garden-related community service and education on- or off-campus to become a certified Master Gardener (https://mastergardener.tamu.edu/become/). Students may also participate in becoming a certified Master Composter to receive bonus credit in the class.

**HORT 2470. Introduction to Turfgrass Science. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An introduction to turfgrass history, benefits, and use. Growth and development of various turfgrass species and their culture.

**HORT 3300. Plant Propagation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Principles of propagating plants, including vegetables, ornamentals, and fruits. Methods of handling seed; starting plants by the use of cuttings, layers, buds, grafts, and bulbs; ways of propagating specific plants; factors influencing growth of plants after transplanting. Prerequisites: BIOL 1406 and HORT 1301. Lab fee $2.

**HORT 3301. Landscape Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Planting design and use of plants in the landscape. Use of drafting instruments, preparation of plans, perspective drawings, and cost estimates. Prerequisite: Prior completion of or concurrent enrollment in HORT 3390.

**HORT 3309. Aquaponics. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Students will examine the pros and cons of various aquaponics methods like raft, nutrient film, vertical towers, and media filled beds and their applications for growing fish and plants sustainably for a family/community or for profit. Students will construct a backyard aquaponics system, establish/harvest plants, and prepare a meal in laboratory. Topics covered are plant and fish choices and recommendations; planting/growing techniques; fish biology, stocking rates, and feeds; plant/fish care and health; water quality; system design, filtration and plumbing components; daily operation; greenhouse management/seasonal adjustments; system start up; food preparation; economics and business considerations.

**HORT 3320. Landscaping and Gardening Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of landscape, interior, and floral design. Plant identification, environmental requirements, and culture. Prerequisite: HORT 1301 or equivalent. Lab fee: $2.

**HORT 3370. Floriculture. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Principles and basic techniques in floral design and merchandising, introduction to the floral branch of the horticulture industry and floral production.

**HORT 3390. Horticultural Plants. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Identification, classification, and characteristics of horticultural plants. Includes the study of trees, shrubs, aroids, cacti, bromeliads, ferns, begonias, and orchids. Prerequisite: HORT 1301 or equivalent or approval of department head. Lab fee $2.

**HORT 3415. Weed Management. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
General principles in the development of weed management programs. Common weed ecology and life cycles, land management factors, herbicide selection and performance, and cultural control strategies are presented. Laboratory includes weed identification and herbicide application methods. Prerequisites: AGRI 1307 and AGRI 1107; or WSES 1305; or HORT 1301.

**HORT 4086. Horticultural Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Individualized study of current topics in student's major concentration of study or supporting discipline. Specific content and credit dependent upon student's interest, needs, and depth of study.

**HORT 4088. Undergraduate Research in Horticulture. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Fundamental research methods will be addressed through a faculty-directed project. Participation in an abbreviated lecture series may be required. Project components may include a literature review, data collection and analysis, testing, planning, project design, and/or computer modeling. Student may be required to prepare a final report and produce a presentation.

**HORT 4090. Special Topics. 6 Credit Hours (Lecture: 6 Hours, Lab: 6 Hours).**
Selected topics in horticulture. May be repeated for credit when topics vary.

**HORT 4301. Greenhouse and Nursery Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A study of the variables affecting greenhouse and nursery crop production. Both economic and physical variables will be explored. Particular emphasis will be placed on management techniques used by commercial establishments in producing and marketing ornamental nursery and greenhouse plants. Prerequisites: HORT 1301 and 3300. Lab fee $2.

**HORT 4320. Landscaping with Native Plants. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Identification, characterization, and utilization of herbaceous and woody plants indigenous to Texas and other areas useful for landscaping purposes. Principles and procedures of xeriscaping will be emphasized. Field trips will be required. Prerequisite: HORT 1301.

**HORT 4323. Vegetable Production. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Vegetable production techniques including site selection, nutritional requirements, insects, diseases and varieties. Emphasizing small scale gardening techniques, crop rotation, and layout and design parameters to maximize production on small land areas. Seasonal variations (spring, summer, fall and winter) that influence crop selection and management. Prerequisite: HORT 1301.

**HORT 4330. Horticultural Enterprises. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Horticultural business and educational enterprises will be visited or explored. Students are required to complete a business portfolio which will include photographs and written documents. Prerequisite: Jr or Sr classification. Lab fee: $2.

**HORT 4350. Retail Horticulture. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The establishment and management of a retail store with emphasis on plant display, care, and marketing in a retail environment, and on customer relations with respect to common home and landscape problems. Prerequisite: Junior classification or approval of department head. Lab fee $2.

**HORT 4470. Turfgrass Management and Irrigation. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Characteristics and management of turfgrasses used for home lawns, recreational areas and sports fields. Turfgrass irrigation system design. Prerequisites: HORT 2470; or AGRI 1307 and AGRI 1107.

**HORT 5086. Horticulture Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Advanced independent study and research on horticultural topics. Credit hours dependent upon depth of study and type of report submitted to supervising professor. Prerequisite: Approval of instructor of record.

**HORT 5390. Special Topics. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Selected topics in horticultural sciences. May include field trips, independent study, research, community service projects, or other activities beyond the classroom. Prior academic training or experience requirements vary with topics offered. May be repeated once for credit as topics vary. Prerequisite: Consent of instructor or department head.

# Health Professions Technology

## Courses

**HPTC 3320. Biotechnology and Bioethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will cover the recent advances in biology which have made new techniques and technologies possible for the production of pharmaceuticals, foods, textiles, pesticides and chemicals. Ethical principles in biotechnology and biomedicine are studied and applied to contemporary problems in medicine and biomedical research. Additional topics include stem cell research; genetic testing; organ transplantation; and research involving human subjects.

**HPTC 3350. Microbiology for Allied Health Professionals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will focus on an introduction to modern medical microbiology that is clinically relevant for the allied health professional. General concepts of bacterial, viral, parasitic and fungal infection will be addressed, followed by a survey of the major human pathogens in each of these categories. Conclusion of the course will include microbiology issues that are applicable to clinical infection control protocols.

**HPTC 4304. Health Care Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Comprehensive survey of management principles and practices in the health care setting, with particular attention to the allied health arena. Management strategies, strategic planning and implementation, budgetary preparation, personnel resource management and compliance with governmental and professional accreditation regulations are addressed with integration of health care ethics.

**HPTC 4305. Issues and Trends in Health Care. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is designed to explore and discuss concepts and issues that are pertinent to allied health care professionals including legal and regulatory issues, health service reform and cost containment, workforce development, and quality assurance practices.

**HPTC 4349. Pharmacology for the Allied Health Professionals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will focus on a survey of the more important drugs used in medicine, including basic principles, clinical uses and possible adverse effects. Students will be introduced to important issues affecting drug approval, legislation, manufacturing, formulation and delivery, metabolism and measurement.

**HPTC 4350. Pathophysiology for the Health Professionals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will focus on presentation of interrelationships between normal body functioning and the physiologic changes that participate in disease production, and occur as a result of disease. Emphasis on major disorders and other selected disorders provides a concise, easy-to-understand introduction to the fundamentals.

# Human Resource Management

## Courses

**HRMT 5086. Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
This course offers students the opportunity to study human resource management topics and perform research within the student's area of interest as directed by the responsible professor. Prerequisite: approval of the department head.

**HRMT 5301. Law and Regulation in Human Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines legal issues and regulatory processes related to employment relationships, equal employment opportunity and affirmative action, privacy, employment testing and staffing, copyrights and patents, compensation and benefits, employee/labor relations, and occupational health and safety.

**HRMT 5302. Human Resource Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Presents the fundamental principles and techniques of personnel management and examines the management of human resources from the point of view of the personnel officer, the operational manager and the employee. Examines the responsibilities of organizational leadership for incorporating human resource issues in strategic planning and initiatives. Emphasis is placed on current legal considerations, issues and research. Credit for both MGMT 5302 and HRMT 5302 will not be awarded.

**HRMT 5303. Training & Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on elements of employee training and development within organizations and the management of the human resource development process. Examines management issues, identifying and responding to training needs, cost/benefit analysis, four-phase training evaluation, and the selection and development of training staff. Overall Course Objective As a result of this course, students will be able to successfully plan, design, and develop a business training program that effectively addresses a business problem.

**HRMT 5310. The Adult Learning Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines learning patterns, interests and participation among adults, with implications for training and development programs. Particular attention is given to the joint responsibility for learning between trainer and adult participants.

**HRMT 5314. Workforce Planning & Talent Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on the legal, ethical and organizational considerations related to recruitment, assessment, selection, placement and appraisal of employees and managers within various types of organizations including aspects of the role of the EEOC, INS, DOL and other enforcement agencies in this critical human resource function. Career development and record-keeping will also be addressed as will utilization of human resources within organizations including the use of pre and post-employment tests and other techniques in human resource management. Prerequisite: Admission to the COBA Graduate Program.

**HRMT 5315. Employee Benefits and Services. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines legal, social and technical issues and research surrounding current trends in employee benefit programs. Group health, disability and life insurance, retirement planning, time-off (leave) and wellness programs are addressed. Emphasis is placed on program administration, implementation and evaluation. Prerequisite: HRMT 5301 or approval of the instructor.

**HRMT 5316. Compensation Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analyzes the theories, concepts, operational practices and research related to managing comprehensive compensation programs. Various types of compensation plans, including job evaluation levels and wage structures are investigated. Emphasis is placed on the development of sound compensation programs which consider current trends, legal implications and social requirements. Quantitative applications are required to analyze various case studies and problems. Prerequisites: HRMT 5301.

**HRMT 5324. Employee & Labor Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Exploration of the labor union movement and the process of collective bargaining, the formation of a union, labor agreement negotiation, labor agreement administration, grievance processes, and arbitration and mediation. Labor law and legal issues in labor relations are explored extensively to include the National Labor Relations Act and the functions of the NLRB. Negotiation skills are developed via mock labor contract negotiations. Prerequisite: Admission to the COBA Graduate Program.

**HRMT 5354. International Human Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Coverage of the special Human Resource issues corporations face when doing business internationally. Topics include the impact of culture, managing expatriates, global labor markets, recruiting globally, managing diverse teams, global employee benefits, repatriation, global security and terrorism. Credit for both HRMT 5354 and HRMT 5389 will not be awarded. Prerequisite: Admission to the College of Business Administration Graduate Program.

**HRMT 5355. Internship in Human Resource Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Provides work experience in the human resource field under the supervision of a faculty-approved management sponsor. Emphasis is placed on the application of human resource management skills to real world, practical problems and situations. A minimum of 20 work hours per week is expected, with a total of 200-300 on-the-job hours required during the semester. Prerequisite: Completion of 12 graduate semester hours in Human Resource Management, preregistration coordination and approval of the course instructor. Field experiences fee $50.

**HRMT 5380. Strategic Human Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Coverage of the special Human Resource issues related to strategy formulation, competitive advantage, and the linkage between HR strategy and the mission, vision, and goals of corporations that lead to organizational effectiveness. An integrated view of the HR disciplines addressed in the MS HRM core curriculum and the interplay among the various disciplines. Course should be taken in the last semester of the student's program. Prerequisites: Admission to the College of Business Administration Graduate Program and approval of instructor. Co-requisites: The remaining MS HRM core courses.

**HRMT 5388. Thesis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisite: Approved research methodology course and approval of instructor of record.

**HRMT 5389. Global Human Resource Management Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of basic international business concepts, cultural literacy, and discipline specific content are applied to practical experiences and activities in the foreign country visited. Graduate students will be required to complete an extensive research project in addition to other course requirements. A study abroad at the student's expense is required. Credit for both HRMT 5354 and HRMT 5389 will not be awarded. Prerequisites: Admission into a COBA graduate program and permission of the instructor.

**HRMT 5391. Human Resource Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics of current importance to human resource management. May be repeated for credit when topics vary.

# History, Sociology, and Geography

## Courses

**HSGG 1100. Transitioning to University Studies in History, Sociology, and Geography. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of cultural awareness perspectives and opportunities to explore diversity. The course will also introduce students to the History, Sociology, and Geography department.

# Humanities

## Courses

**HUMA 1315. Fine Arts Appreciation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey course emphasizing the relationships of art, music, and theatre in the history of Western civilization. Designed especially for entry-level majors in these fields, but may be taken by any student. Requirements may include listening assignments and field trips to galleries and concerts.

# Interior Design

## Courses

**INDS 1301. Intro to Interior Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Includes study of cultural, technological, and economic influences on the profession. Topics include fundamental vocabulary and concept, historical evolution of interior design, and the role of interior design on the built environment.

**INDS 2311. Interior Design Fundamentals. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Applying the principle and elements of design to traditions of space, form, color, and light including human factors, space planning, properties and applications of interior materials and systems with components of style. Prerequisites: ARTS 1316, ARTS 1317. Prerequisite: ARTS 1316 and ARTS 1317 Lab fee: $15.

**INDS 2314. Interior Design I. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Design development of small commercial spaces with consideration for physiological and psychological effects as well as specifications and lighting. Prerequisite: ARTS 1317 and INDS 2311 Lab fee: $15.

**INDS 3310. History of Interiors. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
History of the styles of architecture, interiors, furnishings, and decorative arts between prehistory and the 21st Century.

**INDS 3314. Interior Design II. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Residential interior space problem solving with regard to aesthetics, utility, and lifestyle function; attention paid to building code specifications, lighting, and budget. Rooms studied individually and as a whole. Prerequisite: Scoring a "C" or above in INDS 2314. Lab fee: $15.

**INDS 4330. Architectural Finishes and Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The study and use of architectural details and mechanical systems for interiors. Prerequisite: A "C" or better in INDS 2314 and INDS 3314. Lab fee: $15.

# Kinesiology

## Courses

**KINE 1100. Transitioning to University Studies in Kinesiology. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective.

**KINE 1210. Archery. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
An introductory study of target archery. This course will include history, skills of shooting, equipment, and safety.

**KINE 1218. Golf. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to provide instruction in the basic skills of golf; putting, chipping, pitching, and full swing. An additional fee is required for facility rental and equipment use. Students must provide their own transportation to Legends Golf Course & Driving Range.

**KINE 1220. Fitness Walking. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to reduce sedentary lifestyles and enhance overall health & fitness by increasing cardiovascular endurance, muscular strength & endurance, and improve body composition.

**KINE 1221. Cardio Fitness. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to enhance overall health & fitness by increasing cardiovascular endurance, muscular strength & endurance, and improve body composition. Students are encouraged to refrain from a sedentary lifestyle. Activities include walking, indoor cycling, indoor rowing, and other aerobic activities.

**KINE 1222. Racquet Sports. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course provides students with an opportunity to experience and learn a wide variety of racquet sports such as: racquetball, badminton, pickleball, speedminton, and others. The course is designed to teach the basic rules, regulations and skills of each racquet sport.

**KINE 1223. Swimming. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
Basic and advanced swimming technique, water safety procedures, and the development of health-related fitness.

**KINE 1224. Scuba Diving. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course teaches the PADI Open Water Diver scuba certification through a combination of classroom knowledge development, confined water (swimming pool) instruction, and real-world open water dives. An additional activity fee is required to cover equipment use, air fills, text books, and PADI certification costs. Students must provide their own headgear and footgear. Basic swimming skills are required.

**KINE 1225. Advanced Scuba Diving. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course teaches the PADI Advanced Open Water Diver scuba certification through a combination of classroom knowledge development, confined water (swimming pool) instruction, and real-world open water dives. An additional activity fee is required to cover equipment use, air fills, text book, and PADI certification costs. Students must provide their own headgear and footgear. The prerequisite to this course is the PADI Open Water Diver certification (KINE 1224 or equivalent). Basic swimming skills are required. Prerequisite: PADI Open Water Diver certification (KINE 1224 or equivalent).

**KINE 1226. Lifeguarding. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to meet American Red Cross (ARC) requirements related to lifeguarding and basic water safety skills. Upon successful completion of the course, the student will be awarded the American Red Cross Lifeguard Training certificate and CPR/AED/First Aid certification for Lifeguards. An additional fee is required to cover ARC textbook, ARC ancillary materials, and ARC certification cards. Basic swim skills are required. Prerequisite: Must be 15+ years of age, able to swim 500 yards, able to retrieve an object from under 10 feet of water, and able to tread water for 2 minutes without the use of the hands.

**KINE 1230. Powerlifting. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to provide a competitive weight lifting program for both novice and advanced lifters. Instruction will focus on exercise techniques, training principles, programming, and practical strength training application. The course will concentrate on improving the individual's 1-rep max in Squat, Deadlift and Bench Press by using different methods of resistance exercises. An optional fee is necessary for students who want to travel to competitive powerlifting events; the optional fee will be used to cover entry fees and travel to/from event.

**KINE 1231. Strength Bootcamp. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to promote the overall health & wellness benefits of strength training by incorporating High Intensity Interval Training (HIIT) in a motivating bootcamp setting. Traditional calisthenics, body weight exercises, speed work, agility drills, power development, reaction time, and balance workout will be designed to address and improved: cardiovascular endurance, muscular strength and endurance, flexibility and body composition.

**KINE 1232. Weight Training. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to teach the beginning weight training student the various types and benefits of strength training.

**KINE 1233. Aerobic Dance. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is design to explore dance as an aerobic exercise option as well as develop an appreciation for wellness by participating in various styles of dance.

**KINE 1235. Aquatic Fitness. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed for students to engage in basic water resistance exercises, shallow water plyometrics, stretching and strength exercises, and deep water muscular endurance exercises. This is an excellent opportunity to engage in a low-impact alternative to land-based fitness activities. No previous experience or aquatic expertise is required for this class.

**KINE 1236. Dance Techniques & Fundamentals. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to provide a basic foundation of dance with an emphasis on the fundamentals of dance. The class will consist of beginner ballet, jazz, hip hop, and modern dance techniques. The artistry and physicality of dance will be emphasized.

**KINE 1237. Innovative Dance. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
Intermediate level course that continues the exploration of ballet, jazz, hip hop, and modern dance techniques. Pom techniques will also be introduced. NOTE: Basic foundation of dance techniques & fundamentals or successful completion of KINE 1236 (Dance Techniques & Fundamentals) is encouraged. Prerequisite: This course is highly recommended for students interested in auditioning to become a member of the Texan Stars dance team or for current members of the Texan Stars dance team.

**KINE 1240. Dance Performance. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed for individuals who are members of the Texan Stars Dance team or Tarleton Cheer teams. It shall serve as a support group for school events/activities and promote school loyalty and spirit. NOTE: This course is intended for students currently participating on the Texan Stars or Texan Cheer teams at Tarleton State University. Prerequisite: Student must submit application, meet fitness and performance standards, and participate in a formal try-out. Please contact the Director of the Texan Stars or the Director of Texan Cheer for more information.

**KINE 1241. Global Sports I - Rugby, Soccer, Sand Volleyball. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed provide a diverse offering of games and sports that are played on an international level. The games and sports taught within this course will include, but are not limited to: Rugby, Soccer, and Sand Volleyball.

**KINE 1242. Global Sports II - Lacrosse, Cricket, Team Handball. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed provide a diverse offering of games and sports that are played on an international level. The games and sports taught within this course will include, but are not limited to: Lacrosse, Cricket, Team Handball.

**KINE 1243. Disc Golf. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course introduces the fundamentals of disc golf. Emphasis is placed on basic throwing techniques, putting, distance driving, scoring, and single and doubles play. Tournament and match play formats will also be introduced. NOTE: Basic equipment will be provided; however, students will be required to purchase specialty discs and carrying bag. Students must provide their own transportation to the Stephenville City Park.

**KINE 1244. Rock Climbing. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course introduces students to top-rope rock climbing and bouldering techniques in both an indoor and outdoor environment. Topics include equipment, knots, belaying, rappelling, anchor systems, and a range of climbing techniques. Risk assessment and safety techniques are thoroughly addressed throughout the course. NOTE: An additional fee is required for facility rental and equipment use. A day trip (1 day) to Mineral Wells State Park will be required; students must provide their own transportation to the park and pay their entry fee.

**KINE 1245. 5K / 10K Training. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
The course is designed for students who are interested in inspirational exercise, goal setting, and personal improvement through social & competitive walking and/or running. The course will begin with low intensity, short distance training before progressing into a more aggressive training scheme. The course will cover proper walking & running mechanics, types of training (5K, 10K, Trail Runs), weather conditions, and the benefits of cardiovascular training. NOTE: Students will be required to register and complete two events (5K, 10K, Color Run, Mud Run, Spartan Run, etc.). The entry fee for each event and transportation to/from the events will be the responsibility of the student.

**KINE 1246. Hunting and Fishing. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course is designed for outdoor enthusiasts. Students will learn fundamental firearm safety, fishing rules and regulations, hunting rules and regulations, environmental recognition (aquatic life, wild-game species and gender identification), license and permit procedures, general outdoors law, seasonal guidelines and conservation methods. The 'Texas Parks and Wildlife Outdoor Annual Hunting and Fishing Regulations' will serve as the foundation for this course. FISHING: Basic fishing gear will be provided; however, students may bring their own fishing gear. Three day trips to area lakes will be required; students must provide their own transportation to the lakes. Students must purchase a Texas fishing license. HUNTING: An additional fee is required to cover ammunition and targets. Students must provide their own transportation to the shooting range. Two day trips to area game ranches will be required; students must provide their own transportation to the ranches. Students must purchase and pass a Hunter Safety course.

**KINE 1247. Trap and Skeet Shooting. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to introduce students to trap and skeet shooting as well as discuss proper firearm and ammunition selection. Firearm safety and range etiquette will be strongly emphasized. An additional fee is required to cover ammunition and targets. Students must provide their own firearm plus ear and eye protection. Students must provide their own transportation to the shooting range.

**KINE 1248. Yoga I. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course explores the asnas (poses) and vinyasa (flow) of yoga intended to target physical postures, breathing, relaxation, and mental concentration.

**KINE 1249. Yoga II. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
Intermediate level course that continues the exploration of mind and body through asana (poses). This course introduces more detailed aspects of the discipline of yoga. Topics include breathing and physical postures, relaxation, and mental concentration. The goal is to improve yoga practice and to develop an overall deeper understanding of yoga methodology through advanced postures, breathing techniques and relaxation practices. NOTE: Previous yoga experience or successful completion of Yoga I (KINE 1248) is encouraged. Prerequisite: Previous yoga experience or successful completion of Yoga I (KINE 1248) is encouraged.

**KINE 1250. Varsity Athletics. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
This course is designed to introduce the student to competitive intercollegiate athletics. The student will be prepared both mentally and physically to participate and to take part in intercollegiate athletic competitions. NOTE: This course is intended for student-athletes currently participating on a NCAA athletic team at Tarleton State University.

**KINE 1301. Foundations of Kinesiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory course in the field of Kinesiology. Included will be the history of physical education and sport, career opportunities in Kinesiology, and objectives and principles of Kinesiology.

**KINE 1306. First Aid and CPR. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An examination and application of first aid, CPR, and emergency procedures given to victims of accident and illness.

**KINE 1308. Sports Officiating. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A course designed to teach the rules and mechanics of sports officiating in football, basketball, volleyball, and baseball/softball. Students will be required to assist in a variety of officiating activities outside the formal classroom.

**KINE 1338. Concepts of Physical Fitness. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The study of the principles and techniques needed to promote human health and hygiene. Topics will include but not be limited to: fitness assessment and skills, personal awareness and management techniques, self-motivation, proper nutrition, responsibility, and health choices as related to wellness. Health-related physical fitness labs for testing skills and strategies will be conducted. Lab fee: $2.

**KINE 2310. Fundamentals of Sport Pedagogy. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Overview of the physical education profession, including: philosophy, professional standards, program outcomes, appropriate practices, and factors impacting the learning environment. Field-based experience applying course content is a course requirement.

**KINE 2315. History and Philosophy of Sport, Recreation, and Exercise. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine the history and philosophy of physical activity, most notably in relation to the United States. Included areas of study are the exercise sciences, as well as physical education, recreation, and organized sport.

**KINE 2320. Anatomical Kinesiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Investigation and analysis of human motion in relationship to structure and function according to general mechanical laws and other factors. Prerequisite: BIOL 2401.

**KINE 2330. Individual and Dual Sport Skills. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course is designed to provide quality instruction in individual and dual sports skills and activities. It consists of basic knowledge of rules and strategies, planning and implementing quality instruction, and skills testing in selected lifetime sports. Prerequisite: KINE 1301.

**KINE 2340. Team Sport Skills. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course is designed to provide quality instruction in team sport skills and activities. It consists of basic knowledge of rules and strategies, planning and implementing quality instruction, and skills testing in selected team sports. Prerequisite: KINE 1301.

**KINE 2356. Prevention and Care of Athletic Injuries. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The study and application of skills in the prevention and care of injuries affecting the athlete and physically active. Prerequisite: BIOL 2401 Lab fee: $2.

**KINE 2360. Principles of Athletic Coaching. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The course is designed to present foundational knowledge essential for coaching any level athlete in any sport. Emphasis is on a comprehensive approach to the foundations and theories of coaching including development of a coaching philosophy, determining coaching objectives, coaching for character, coaching diverse athletes, motivational techniques, as well as, principles of teaching, physical training, and management.

**KINE 2380. Essentials of Personal Training. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course is designed to prepare and qualify students to work as personal trainers. The course bridges the gap between exercise science-related course work and the practical application skills in preparation for a national certification exam in personal training. Topics include guidelines for instructing safe, effective, and purposeful exercise, essentials of the client-trainer relationship, conducting health and fitness assessments, and designing and implementing appropriate exercise programming. An additional fee is required to cover the costs of the national certification exam, textbooks, and ancillary material. BIOL 2401 recommended.

**KINE 2390. Fundamentals of Group Exercise Training. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course is designed to give students the knowledge and understanding necessary to prepare for the ACE Group Fitness Instructor Certification Exam and become effective group fitness instructors. An additional fee is required to cover the costs of the certification exam, textbooks, and ancillary material.

**KINE 3304. Orthopedic Assessment. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The study and application of principles and techniques for assessment of injuries including signs and symptoms, classification of injuries, and emergency and clinical assessment. Prerequisite: KINE 2356 and BIOL 2401 Lab fee: $2.

**KINE 3310. Tests and Measurements. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Use and function of tests in Exercise and Sport Studies. Test construction and interpretation will be studied. Statistical techniques will be reviewed. Prerequisites: 12 hours of Kinesiology course work and junior classification. Lab fee: $2.

**KINE 3314. Therapeutic Exercise and Rehabilitation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The study and application of therapeutic exercise tools and techniques in the rehabilitation of injuries including restoration of flexibility and range of motion, muscular strength, endurance and power, cardiorespiratory endurance, and neuromuscular control and balance. Prerequisites: KINE 2356 and BIOL 2401.

**KINE 3320. Theory of Strength Training and Conditioning I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study and survey of contemporary strength training and conditioning. Successful completion of the course allows the student to sit for the appropriate examinations relative to being certified as a Strength and Conditioning Specialist. Conditioning Specialist. Prerequisite: BIOL 2401 Lab fee: $2.

**KINE 3326. Outdoor Adventure. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Outdoor resources and adventure activities are utilized as opportunities for experiential learning. Activities can include the Tarleton Challenge Course, hiking, backpacking, camping, mountaineering, rock climbing, biking, canoeing, kayaking, orienteering, safety and first aid. Lab fee: $2.

**KINE 3330. Motor Behavior. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the behavioral characteristics for skill acquisition due to motor, physical, and neuromuscular development. Prerequisite: approval of the department head. Lab fee: $2.

**KINE 3333. Tactical Strength and Conditioning. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Built on scientific principles and evidence-based research, the NSCA Tactical Strength and Conditioning (TSAC) Training Course is a foundational strength and conditioning program designed to provide tactical facilitators with the tools to decrease injury risk and increase longevity and effectiveness of tactical professionals. The TSAC Practitioners Course provides the principles of program design, basics of coaching exercise technique and mechanics, and how to lead a physical readiness program. An additional fee is required to cover the costs of the certification exam, textbooks, and ancillary material. Prerequisite: NA.

**KINE 3350. Corrective Exercise Training. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course will present an evidence-based approach to corrective exercise, the components of a comprehensive solution, and the practical know-how to develop and implement integrated strategies to improve common movement impairments. Students completing this course will be prepared to take NASM's Corrective Exercise Specialist credentialing examination. An additional fee is required to cover the costs of the certification exam, textbooks, and ancillary material. Prerequisite: KINE 2380.

**KINE 3355. Principles of Health and Physical Education In Elementary Schools. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The knowledge, skills, and dispositions for teaching developmentally appropriate health and physical education in elementary schools.

**KINE 3360. Sports Nutrition. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course covers the essentials of human nutrition that improve and sustain optimal performance for sport and exercise. The effects of eating disorders (in both male and female athletes), weight management, sport supplements, and application of nutritional concepts related to the physically active individual seeking improved athletic performance will be addressed. An additional fee is required to cover the costs of the certification exam, textbooks, and ancillary material.

**KINE 3365. Principles of Health and Physical Education In Secondary Schools. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The knowledge, skills, and dispositions for teaching developmentally appropriate health and physical education in secondary schools.

**KINE 3370. Physiology of Exercise. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Effects of physical exercise on body processes. Prerequisite: BIOL 2401 Lab fee: $2.

**KINE 3375. Legal Issues in Sport and Recreation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course is designed to examine the legal issues involved in the supervision, management, and business operations of sport and recreation organizations. Students are provided with an introduction to various areas of law including: tort law, contract law, agency law, employment law, constitutional law, and product liability.

**KINE 3380. Adapted Physical Activity. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An introduction to adapted physical activity, including physical education, recreation, leisure, and sport for individuals with disabilities of all ages. Practical application with individuals with special needs is a course requirement.

**KINE 3385. Program Design for Special Populations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in depth study of the positive effects of exercise on the performance and quality of life of specific disease populations. The course teaches the student to design and modify exercise programs to fit the individual's needs. This course is taught using the ISSA Exercise Therapy curriculum. An additional fee is required to cover the costs of the certification exam, textbooks, and ancillary material.

**KINE 3390. Kinesiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Investigation and analysis of human motion in relationship to structure and function according to general mechanical laws and other factors. Prerequisite: BIOL 2401.

**KINE 4085. Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
This course will focus on current topics and issues of interest in exercise and sport studies. It may be repeated for credit as topics change. Prerequisite Course(s):Junior level standing or approval of department head.

**KINE 4086. Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Directed study of selected problems in Kinesiology. May be repeated for credit with approval of department head. Restricted to Kinesiology majors and minors.

**KINE 4302. Psychological Aspects of Sports. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course gives students a basic overview of sports psychology, covering aspects such as confidence, focus, mental training, visualization, peak performance,and the mind-body connection. It also examines the differences between group and individual sports and the mindsets of the prototypical athletes who engage in them. Prerequisite: Junior or higher classification.

**KINE 4305. Capstone in Kinesiology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Applied learning experience for Kinesiology majors. Students will complete capstone experiences within the department including professional development points, health related fitness components, interview and etiquette skills, resume and portfolio. Prerequisites: Senior classification (90 hours, counting in progress hours) REQUIRED.

**KINE 4330. Exercise Testing and Prescription. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Physiology of exercise in the treatment of the degenerative effects of sedentary lifestyles associated with chronic disease and/or disabilities. Prerequisite: KINE 3370 or KINE 4320. Lab fee: $2.

**KINE 4335. Applications in Clinical Exercise Physiology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Advanced course in clinical exercise testing and prescription in individuals with chronic diseases of cardiovascular, pulmonary, metabolic, musculoskeletal, neuromuscular, and immunologic origin. Students will be actively engaged in testing and prescribing exercise for actual clients in a laboratory setting. Prerequisites: previous or current enrollment in KINE 4330 Lab fee: $2.

**KINE 4340. Exercise Electrocardiography. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A study of the rate, rhythm, and axis of the heart obtained during graded exercise testing. Prerequisite: BIOL 2401 and KINE 3370 Lab fee $2.

**KINE 4350. Recreational and Sport Facility Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to the concepts, theories and practices related to the administration and management of athletic, physical activity, and recreational facilities. The course is designed to familiarize students with the basic concepts of facility planning, construction, facility operations, event planning, security, and finance. Areas under examination include facilities for scholastic, intercollegiate, amateur, professional, international and recreational sport.

**KINE 4360. Theory of Strength Training and Conditioning II. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An in depth study of the effects of strength and conditioning on performance. This course is designed to be a follow up course to KINE 3320 and will help students further the knowledge and skills expected of a Certified Strength and Conditioning Specialist as defined by the NSCA. An additional fee is required to cover the costs of the certification exam, textbooks, and ancillary material. Prerequisite: KINE 3320 Lab fee: $2.

**KINE 4370. Organization and Administration of Sport and Recreation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course designed to study the principles, practices, and procedures in the organization and administration of sport and recreation.

**KINE 4384. Clinical Internship in Kinesiology. 3 Credit Hours (Lecture: 1 Hour, Lab: 10 Hours).**
Supervised internship with selected agencies and organizations.

**KINE 4390. Biomechanics. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course is designed to study the mechanics of human movement. The course design provides insight into the basic laws governing the forces of stability and motion. Interpretation and understanding of biomechanical principles will be addressed to enable coaches, athletic trainers, fitness, and clinical professionals to optimize human performance and rehabilitation. Prerequisite: BIOL 2401 and KINE 3390.

**KINE 4682. Internship in Kinesiology. 6 Credit Hours (Lecture: 1 Hour, Lab: 20 Hours).**
Supervised internship with selected agencies and organizations including: rec sports, athletics, schools, parks and rec, YMCA/YWCA, Boys/Girls Clubs, Boy/Girl Scouts, rehabilitation centers, cardiac rehab, etc.

**KINE 5086. Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Directed study of selected problems in Kinesiology.

**KINE 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
This course is scheduled when the student begins the thesis. No credit is given until the thesis is completed. Prerequisite: KINE 5301.

**KINE 5301. Readings in Kinesiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of published reports and research in the field of Kinesiology.

**KINE 5302. Advanced Psychological Aspects of Sports. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to help students both learn and apply practical and theoretical information as it relates to psychology of sport. Mental training skills that can enhance athletic performance will be included. Additional areas include stress, motivation, goal-setting, leadership, imagery, and self-efficacy.

**KINE 5303. Research in Kinesiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course is designed to prepare students for research publication and presentation within the Kinesiology discipline.

**KINE 5304. Principles of Sport Organization. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to teach the functions of organization and management in a sport context as well as traditional and contemporary principles and theories thereof.

**KINE 5305. Administration of Athletics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the administrative functions of directors of athletic programs. Liability laws, financial administration, personnel, public relations, and state laws governing athletic programs will be explored.

**KINE 5306. School and Community Health. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the critical health issues facing schools and communities.

**KINE 5310. Social Psychology in Sports. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course gives students a basic overview of sports psychology, covering aspects such as confidence, focus, mental training, visualization, peak performance, and the mind-body connection. It also examines the differences between group and individual sports and the mindsets of the prototypical athletes who engage in them. Prerequisite: Graduate standing.

**KINE 5312. Contemporary Issues in Sports Medicine. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview and study of contemporary issues as related to Sports Medicine.

**KINE 5313. Administrative Practices in Sports Medicine. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination and application of administrative practices related to Sports Medicine.

**KINE 5314. Special Topics in Sports Medicine. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview and study of selected special topics as related to Sports Medicine.

**KINE 5315. Education and Research in Sports Medicine. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the application of strategies and technology to enhance Sports Medicine education and of selected research topics as related to Sports Medicine.

**KINE 5316. Leadership and Professional Development in Sports Medicine. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study and application of the concepts and principles of leadership and professional development as related to Sports Medicine.

**KINE 5317. Leadership and Professional Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course designed to prepare students for the leadership roles related to Kinesiology and Athletics. Issues in Professional development will also be examined.

**KINE 5325. Exercise Prescription Through the Lifespan. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Advanced course in clinical exercise testing and prescription relative to children, healthy adults, and diseases of the cardiovascular, pulmonary, metabolic, musculoskeletal, neuromuscular, and immunologic systems. It is designed to provide the student with a basic understanding of the pathophysiology and exercise responses in these populations and as related to the American College of Sports Medicine.

**KINE 5326. Facilities in Kinesiology, Athletics, and Recreation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles, terminology, and standards for planning, constructing, and maintaining kinesiology, athletic, and recreation facilities.

**KINE 5328. Adapted Exercise and Sport. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of muscle re-education and the application of exercise to orthopedic, muscular, and neurological disorders. Principles of planning and directing adapted and therapeutic exercise and sport programs.

**KINE 5336. Statistics in Kinesiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of descriptive and inferential statistical techniques used in a variety of health-related and athletic-related tests. Test construction, reliablility, validity, and objectivity methods will be studied.

**KINE 5340. Motor Learning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the theories and practical applications of human motor performance and achievement.

**KINE 5342. Advanced Principles of Athletic Coaching. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course is designed to present knowledge essential for coaching any level (youth, recreational, club, elite, and professional) athlete in any sport. Emphasis is on a comprehensive approach to the foundations and theories of coaching including development of a coaching philosophy, determining coaching objectives, coaching for character, coaching diverse athletes, motivational techniques, as well as, principles of teaching, physical training, and management.

**KINE 5343. Law for Sport and Recreation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines legal issues related to the administration and management of athletic, and recreation programs. Issues include the area of tort, constitutional, contract, employment, and statutory law. Also discussed are the issues of intellectual property, products liability, and antitrust. Case law is used to illustrate the application of the law in everyday situations.

**KINE 5370. History of Sport and Physical Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of physical education and sports from the origins in Ancient Greece to the present. The emphasis on social and cultural developments that contributed to the growth of physical education and sports in the modern world.

**KINE 5385. Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview and study of various topics related to Kinesiology.

**KINE 5399. Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 7 Hours).**
Supervised experience in related fields in Kinesiology.

# Foreign Language

## Courses

**LANG 1411. Foreign Language Immersion. 4 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
Foreign language immersion in a language other than FR or SPAN for communication on a basic level. Applies the four skills approach of reading, writing, listening, and speaking. Lab fee: $5.

**LANG 1412. Beginning Foreign Language II. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
Continuation of the four skills introduction to the foreign language for communication on a basic level. PREREQ: LANG 1411 or equivalent as approved by the department head. Prerequisites: LANG 1411. Lab fee: $5.

**LANG 2311. Intermediate Foreign Language I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Review of basic language structure, oral and written expression on an intermediate level. Prereq: LANG 1411 and 1412, or equivalent as approved by the department head. Prerequisites: LANG 1411 and 1412.

**LANG 2312. Intermediate Foreign Language II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
intensive review of language and structure with continued practice in oral and written expression at an intermediate level. Prerequisite: LANG 1411, 1412, 2311 or equivalent as approved by the department head.

# Liberal and Fine Arts

## Courses

**LBFA 1100. Transitioning to University Studies in the Liberal and Fine Arts. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of cultural awareness perspectives and opportunities to explore diversity.

# Leadership Studies

## Courses

**LDRS 1201. Basics of Self-Leadership and Staff Work. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Individual assessments to provide insights into personal traits, characteristics, and tendencies. Basic skills of time management, goal setting, and personal planning. Identifying organizational protocols and procedures. Develop interpersonal communication skills, project implementation and quality assurance. Fundamentals of reporting orally and in writing.

**LDRS 1202. Leadership and the Humanities. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Introduction to leadership as an object of study through examination of its historical foundations and intellectual development. Readings selected from history, literature, philosophy, political theory, religion, and social theory. Emphasis on assessing these texts in light of reasoned argument and on drawing out their implications for leadership studies.

**LDRS 2301. Foundations of Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced study of leadership theories and models. Explores major theories and applications associated with various leadership practices throughout the late 20th and early 21st centuries. Provide students the framework to critically think about their leadership philosophy and the situations they will encounter in future careers.

**LDRS 2302. Elements of Leading Teams. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced study of team leadership and management. Explores team and group dynamics, organization, planning, and group behavior. Strategies for organizational assessment, tools for developing people within organizations, and techniques for developing and delivering training programs.

**LDRS 3301. Leadership and Change. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This survey course introduces the student to a broad range of concepts, theories, and practices important for a basic understanding of the similarities and differences between leadership and management. Contemporary and advanced issues in change leadership such as creating a climate for change, implementing and sustaining change, building a change vision, adaptive leadership and change readiness.

**LDRS 3302. Leadership and Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced study of important historical and contemporary ethical theories. Includes assessment and development of character and actions, application of ethical theories, their justification and relationship to society, and objective or subjective status in today's society.

**LDRS 4086. Independent Study. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Topics vary according to student need. May be repeated for a maximum of 6 hours. Open to students of junior or senior classification. Prerequisite: Approval of the department head.

**LDRS 4108. Leadership Studies Capstone. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Culmination of comprehensive knowledge gained about leadership and social change throughout a student's undergraduate career. Involves reflection on collegiate leadership experiences and coursework in the leadership minor. Results in student development of an electronic portfolio (i.e., ePortfolio). Prerequisites: Senior standing.

**LDRS 4384. Leadership Field Experience. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
A supervised field based internship in which the student applies skills and knowledge gained through the John Tarleton Leadership Academy. The course provides students with an opportunity to exercise leadership fundamentals, specialized language, or technical/research skills within a governmental, public, or private business organization. Prerequisite: Approval of department head.

**LDRS 4389. Cultural Understanding and Leadership Proficiency. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
This course is Cadet Professional Development Training for the Texan Corps of Cadets and is conducted at various sites outside the United States. It is designed to develop future leaders who are culturally astute, having gained experience to prepare them to lead organizations in a multi-national environment. Prerequisite: Approval of department head.

# Legal Studies

## Courses

**LEGL 3330. Fundamentals of Jurisprudence. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of the dependence of the law on the political regime. Review of classical and modern conceptions with emphasis on the modern. Prerequisite: GOVT 2305, GOVT 2306.

**LEGL 3331. Legal History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the Anglo-American legal tradition. Particular attention paid to legal documents such as Magna Carta, The English Bill of Rights, and the Organic Laws of the United States, and jurists such as Blackstone, Marshall, and Holmes. Prerequisite: GOVT 2305, GOVT 2306.

**LEGL 4084. Paralegal Internship. 3-6 Credit Hours (Lecture: 3-6 Hours, Lab: 0 Hours).**
Application of legal studies education to a paralegal studies internship, which must be successfully completed before graduation. Prerequisite: LEGL 4330, LEGL 4331.

**LEGL 4330. Legal Research and Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to legal research and writing. Emphasis on legal sources, case analysis, and legal citation. Prerequisite: LEGL 3330, LEGL 3331, POLS 3309.

**LEGL 4331. Law Office Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to law office management. Emphasis on law office organization, accounting, and legal computing programs. Prerequisite: LEGL 3330, LEGL 3331, LEGL 4330.

**LEGL 4385. Legal Studies Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specialized legal studies course on topics such as natural law, legal positivism, or Roman constitutionalism. May be taken more than once as topics will vary. Prerequisite: POLS 3309, LEGL 3330 or permission of program coordinator.

**LEGL 4386. Problems: Paralegal Specializations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specialized paralegal course on topics such as probate, real estate, or litigation. Prerequisite: LEGL 4330, LEGL 4331 or permission of program coordinator.

**LEGL 4390. Legal Studies Capstone Course. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Application of legal studies education to a final scholarly paper, which must be successfully defended before graduation. Senior status or permission of program coordinator. Prerequisite: LEGL 3330, LEGL 3331, POLS 3309, POLS 4301, POLS 4302.

# Public Administration

## Courses

**MAPA 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thorough and scholarly investigation of a topic acceptable to the thesis committee. The thesis must provide evidence that the candidate has pursued a coherent program of research related to the student's area(s) of specialization, the results of which reveal academic excellence and which make an original contribution to the discipline. Prerequisite: Student must successfully complete the MPA comprehensive examinations and all preliminary coursework. Project must have approval of major professor.

**MAPA 5300. Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This is an introductory, survey course designed to give students an understanding of public administration as a scientific discipline applied to professional practice within the context of American government at the local, state and federal level. Topics include a master's level survey of the major theories of public administration and governance, interagency and intergovernmental relations, agency reform, ethics of public service, organizational dynamics and behavior, human resource issues, and public budgeting and finance.

**MAPA 5301. Organizational Behavior in the Public Sector. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Behavioral theory in organizational context for the public sector. A study of individual and group dynamics in the business environments. Specific emphasis is given to leadership, motivation, communication, employee supervision, and morale in all organizational settings.

**MAPA 5302. Human Resource Management in the Public Sector. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Presents the fundamental principles and techniques of personnel management and examines the management of human resources from the point of view of the personnel officer, the operational manager and the employee for the public sector. Examines the responsibilities of organizational leadership for incorporating human resource issues in strategic planning and initiatives. Emphasis is placed on current legal considerations, issues and research.

**MAPA 5303. NonProfit & Public Sector Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine the role and application of marketing in public and nonprofit settings. The course focuses on a conceptual understanding of the marketing discipline and marketing processes and shows how basic concepts and principles of marketing are applicable to public and nonprofit organizations.

**MAPA 5304. Legal Aspects. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A critical evaluation of the role courts play in American public administration. Topics include the structure, function, and operations of the courts at the state and federal level. Credit will not be awarded for both CRIJ 5304 and/or CRIJ 6304 and/or MAPA 5304.

**MAPA 5307. Statistical Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of basic and advanced descriptive and inferential statistics, with an emphasis on applications in public administration. Credit will not be awarded for both MAPA 5307 and CRIJ 5300. Prerequisite: MAPA 5398 or CRIJ 5398.

**MAPA 5310. Introduction to Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview of the history and intellectual foundation of public administration including the major ideas, developments, theories, concepts, and contributors to the growth of public administration and its practice in the United States. Credit will not be given for both MAPA 5300 and MAPA 5310.

**MAPA 5311. Intergovernmental Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course is a study of the interrelationship of local, state, and federal government entities with emphasis on intergovernmental relations on administration, planning, budgeting, and policy making.

**MAPA 5315. Public Budgeting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a master's level introduction to the principles of planning, budgeting and budget administration as applied to the unique requirements of local, state, and federal government agencies. Although strongly based in budgeting theory, the major course goal is to provide students with the basic skills needed to effectively work as an effective team member with agency professionals and external consultants to create and administer public agency budgets.

**MAPA 5320. State and Local Government. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
State and local governments within the context of the American governmental system. Special emphasis on federalism, the constitutional/legal relationships between state and local governments, and the institutions, organizational forms, and political processes in American state and local government especially related evolving governance models, such as new public management, new public service and other models.

**MAPA 5322. Advanced Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The practical implications of moral philosophy and ethics in a free society on a day-to-day basis in public administration will be discussed. Credit will not be awarded for both CRIJ 5322 and MAPA 5322.

**MAPA 5330. Advanced Public Budgeting and Financial Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an in-depth study of the budgeting and financial management of government agencies. Topics include taxation, bonds, special issues in administering matching funds, grants and grant administration, revenue flow, contracts, and fiscal problems of local and state governments including maintenance of services during revenue shortfalls. Prerequisite: MAPA 5320 Public Budgeting and ACCT 5307 Governmental and Not-For-Profit Accounting or permission of instructor.

**MAPA 5331. Public Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Course provides broad exposure to the fundamental tools of policy formulation, negotiation, implementation and analysis. While competitive markets are often efficient, there are many barriers to perfectly functioning markets, such as market failure(s), that lead to the need for public policy. Ultimately, the goal of the course is to lead students to appreciate the method of thought and processes associated with allocation of resources at their disposal as seems "best" to them — and how this method can be a widely useful tool for assessing the need for and impact of public policy.

**MAPA 5340. Critical Incident Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a graduate level introduction to crisis planning and management for mass casualty and high profile events. Topics include agency roles natural and man-made disasters, terrorism and other major criminal events, and other high profile incidents. Emphasis will be placed in inter-agency cooperation and interfacing in planning, event management, and long-term, post-event management.

**MAPA 5345. Managing Critical Social Problems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide students with an overview of the contemporary social issues and the role of government in management or mitigation of those issues. Topics include crime, employment, health care, neighborhood stability, gentrification and community regeneration, and their effects on community residents.

**MAPA 5350. Public Administration Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course requires demonstration of competency in public management through completion of a substantial research project incorporating independent study and critical analysis of a specialized area of the field. This is the capstone course for the Master of Public Administration Program. Prerequisite: completion of all other course work required for the Master of Public Administration degree, including core courses and emphasis area courses, unless an exception is approved by the major professor.

**MAPA 5380. Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course gives students the opportunity to integrate the more theoretical aspects of their coursework with participant observation of the operations of a government agency closely related to the student's area of specialization. The experience will utilize a series of work assignments within the agency to give students a range of experiences to enhance their understanding of professional, public administration. Students will document their experience for presentation as determined through consultation with their major professor who will arrange placements with agency mentors. Prerequisite: Approval of major professor.

**MAPA 5385. Seminar in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will allow for flexible topic choice related to current and future trends in public administration. Topics such as comparable and futures studies in public administration along with other evolving and emerging issues in public administration can be further explored via this course.

**MAPA 5390. Independent Study. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This is an independent research course requiring development of a literature review. methodology, and/or data collection in collaboration with the supervising professor. Prerequisite: Approval of MPA graduate advisor.

**MAPA 5398. Research Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will introduce students to multiple research methods, specifically applied in the fields of public administration, in particular to public, non-profit and non-governmental organizations, and policy evaluation. This course will assist the student in understanding the role of research and evaluation in public programs. Credit will not be awarded for CRIJ 5398 and MAPA 5398.

**PUAD 3301. Principles of Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory course in public administration and PA theory.

**PUAD 3302. Intergovernmental Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory course exploring and describing the duties, responsibilities and relationships of the American Federalism system.

**PUAD 3303. Introduction to Public Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An introductory course in the public policy making process to include formulation, negotiation and implementation of public policy as well as policy evaluation.

**PUAD 3304. Texas and Local Governmental Intergovernmental Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course on the intergovernmental relationships and responsibilities between state and local governments (counties, municipalities, schools districts and special districts). This course should be offered in a semester in which the state legislature is in session so that students can experience reality based field observation (field trip to the state legislature).

**PUAD 3305. Introduction to Public Budgeting. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will introduce the processes, formats, and theories of public budgeting to include taxation, service delivery levels and expenditures at the federal, state and local levels.

**PUAD 3306. Leadership in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will explore the various leadership theories as well as other related topics to leadership associated with the public sector and public governance.

**PUAD 3307. Futures Studies in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will offer an introduction into futures studies methods and processes and how futures studies can be utilized to improve public administration and prepare future public administration models and issues, particularly as they relate to future conditions, challenges and opportunities facing public administration, responsible government and public governance.

**PUAD 3308. Seminar in Professional Practices in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will offer an introduction into professions and professionalism in public administration. The course will address professional conduct, responsibilities and roles at the various levels of government as it relates to public administrators.

**PUAD 3309. Comparative Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory course in comparative public administration; exposure to other systems of governance and public administration (foreign).

**PUAD 4301. Legitimacy in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will explore legitimacy, legal authority and trust related to public administration. It will also delve into the US Constitution, Constitutional Law and the Federalists Papers and other sources of authority and legitimacy of public administration.

**PUAD 4302. Evidence Based Decision Making in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will explore utilizing information, research, statistics, other types of information and sources as it relates to the disciplined process of evidence based decision making in the public sector.

**PUAD 4303. Emgergency Management in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This class will focus on all areas of emergency management, National Incident Management System (NIMS), Incident Management System (ICS), and the duties and responsibilities of the various players, at all levels of government in responding to natural, man-made, bio-hazard, chemical, medical and terrorist type incidents and how it relates to American Federalism. Included in this course will be the study of emergency management from the perspective of continuity of government and planning related to emergency management.

**PUAD 4304. Organizational Behavior in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Public sector organization behavior related processes, motivation, leadership, systems and other topics related to how public organizations perform, establish and pursue public sector objectives in the public interest paradigm.

**PUAD 4305. Human Resource Management in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Human resource management from the point of view of the unique demands and circumstances found in the public sector including motivation theories, talent management (recruitment, hiring, development, training, promotion and discipline) and strategic human resource needs of public sector organizations, now and into the future.

**PUAD 4306. Project Management in the Public Sector. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will focus on planning, executing and finishing public sector project utilizing a number of systems approaches and project management models.

**PUAD 4307. Public Policy Domains in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will focus on a variety of policy areas (domains), issues and challenges across the spectrum of public administration. This course can be repeated once, but requires the approval of the department head or academic advisor.

**PUAD 4308. Public Policy Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will focus on the policy analysis process to include problem identification, formulation of alternatives, measurement criteria, evaluation and decisions loops and the tools associated with decision-making in the public sector.

**PUAD 4309. Basic GeoSpatial Techniques and Technologies. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Basic introductory course in geospacial technologies and techniques associated with geographical information systems.

**PUAD 4310. GeoSpatial Methods for Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The use of GeoSpacial equipment and techniques, utilizing GIS information for intelligence led governance (aka smart governance), planning and project development and management. Prerequisite: PUAD 4309 or equivalent.

**PUAD 4311. Emerging Issues in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Seminar class on emerging issues across the political, cultural, economic, and social spheres that are related to World/USA issues that might impact public administration at any one or all levels of government -- federal, state and local.

**PUAD 4312. Non-Profit Sector Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will focus on management of nonprofit organizations delivering public goods and services.

**PUAD 4313. Alternative Dispute Resolution and Mediation for Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will focus on alternative dispute resolution methods and mediation for problem-solving associated with individual and community disputes.

**PUAD 4315. Research Methods in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will focus on research methods and processes associated with scholarly inquiry and the practical application of research and evaluation research in public administration.

**PUAD 4316. Statistics in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Dedicated course in statistical methodologies and applications associated with public administration. Prerequisite: PUAD 4315.

**PUAD 4317. Capstone in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course will provide for a capstone experience in public administration leading to the completion of a senior paper in some area of public administration. This course is a required course for the BSPA. Prerequisite: Junior or Senior Status.

**PUAD 4318. Public Administration Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course presents an analysis of contemporary ethical issues in public administration. Classical and contemporary ethical theories will be applied to the discussion of such issues as discretion, corruption, public interest, equity, deception, professionalism, and the nature and meaning of justice. Prerequisite: Junior classification or approval of instructor.

**PUAD 4319. Professional Writings in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The process of developing and documenting information related to undergraduate studies in public administration, including researching, editing, revising, and creating technical reports, case narratives, grant applications and reports, academic and field related research proposals, training modules, and formatting professional correspondence to include memoranda. Students will use word processing and related graphic software. Prerequisites: ENGL 1301 and ENGL 1302.

**PUAD 4384. Internship in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide an opportunity for a student to work in a public sector organization to gain experience, establish work ethic and create a network for career development. Prerequisite: Junior or Senior Status.

**PUAD 4386. Problems in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course provides flexibility of inquiry and study in an area of interest in public administration. Requires approval of department head or academic advisor.

**PUAD 4390. Special Topics in Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course is will examine and explore various topics of interests in public administration that will be determined on an rotational basis. Requires approval of the department head or academic advisor.

# Mathematics

## Courses

**MATH 0001. NCBO Math. 0 Credit Hours (Lecture: 0 Hours, Lab: 0 Hours).**

**MATH 0303. Basic Mathematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course features an intensive study of basic arithmetic concepts and skills, and the introduction to basic algebra as a preparatory course for MATH 0304, Fundamentals of College Algebra. It does not count for degree credit. A student must earn a grade of at least C in order to progress to MATH 0304.

**MATH 0304. Fundamentals of College Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Functions, algebraic expressions, polynomials, exponents, equations, and systems of linear equations. Primarily for non-science and non-mathematics majors; not for degree credit. A student cannot get credit for MATH 0304 if credit has previously been received for MATH 1314. A student must earn a grade of a least C in order to progress to MATH 1314. Prerequisites: Enrollment in this course will be in accordance with the Mathematics Placement and Continuing Enrollment Rules.

**MATH 0305. Foundations of Statistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An intensive study of fundamental concepts and skills that support the processes in statistics and probability. Prerequisites: Enrollment in this course will be in accordance with the Mathematics Placement and Continuing Enrollment Rules.

**MATH 0306. Foundations of College Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An intensive study of fundamental concepts and skills that support the processes in College Algebra. Topics include the study of numeracy and the real number system; algebraic concepts, notation, and reasoning; quantitative relationships; mathematical models; and problem solving. Prerequisites: Enrollment in this course will be in accordance with the Mathematics Placement and Continuing Enrollment Rules.

**MATH 1100. Transitioning to University Studies in Mathematics. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
This course seeks to transition new mathematics majors into university academic life. It will help new students utilize campus resources effectively, learn academic skills, and develop a support network with mathematics faculty and fellow mathematics majors. The course will introduce students to the culture of the mathematics department and mathematics community at large. Prerequisites: Must be a mathematics major.

**MATH 1314. College Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The study of radical, quadratic, polynomial, exponential, and logarithmic functions and expressions. Additional topics may include: the Binomial Theorem; sequences and series, matrices, variations, mathmatical induction, and conic sections. Approved graphing calculator required. Prerequisites: Enrollment in this course will be in accordance with the Mathematics Placement and Continuing Enrollment Rules.

**MATH 1316. Plane Trigonometry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Angles and coordinates, trigonometric functions, solutions of triangles and applications, reduction theorems and formulas, identities and conditional equations, addition formulas and derived relations, angular and linear speed, logarithms, and radian measure. Prerequisite: MATH 1314 or concurrent registration.

**MATH 1324. Math for Business & Social Sciences I (Finite Mathematics). 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Linear equations and applications, linear forms and systems of linear equations, matrix algebra and applications, linear programming, probability and applications, and statistics. Prerequisites: Enrollment in this course will be in accordance with the Mathematics Placement and Continuing Enrollment Rules.

**MATH 1325. Math for Business & Social Sciences II (Business Calculus). 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Application of mathematical concepts to topics from finance, management science, marketing, and economics. Concepts addressed include linear models, exponential functions, probability and statistics, and introductory calculus concepts. This course cannot be counted on a degree program for a mathematics major. Prerequisite: MATH 1324.

**MATH 1332. Contemporary Mathematics I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Elementary mathematical applications to problems of finance, probability, statistics, and geometry, and the development of reasoning skills. This course cannot be counted on a degree program for a mathematics major. Prerequisite: High school Algebra I and II or a grade of C or better in MATH 0304.

**MATH 1342. Elementary Statistical Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Data collection and analysis, elementary probability, discrete and continuous distributions, regression, correlation, estimation, and nonparametric methods. Credit cannot be awarded for both MATH 1342 and MATH 3450. Prerequisites: Enrollment in this course will be in accordance with the Mathematics Placement and Continuing Enrollment Rules.

**MATH 2332. Applied Matrix Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to matrix and vector arithmetic, Gaussian Elimination, matrix factorization, determinant, matrix inverse, eigenvalues and eigenvectors. Applications to be chosen from linear models, linear optimization and the Simplex Method, orthogonal projections and least-square problems, matrix diagonalization, discrete dynamical systems, cryptology and computer graphics. Technology will be emphasized. Prerequisite: MATH 2413.

**MATH 2412. Precalculus Math. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Applications of algebra and trigonometry to the study of elementary functions and their graphs including polynomial, rational, exponential, logarithmic, and trigonometric functions. Additional topics will be chosen from analytical geometry, mathematical induction, sequences, and series. Prerequisites: Enrollment in this course will be in accordance with the Mathematics Placement and Continuing Enrollment Rules. Lab fee: $2.

**MATH 2413. Calculus I. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Algebraic and transcendental functions, limits, continuity, derivatives and related applications, an introduction to the definite integral, integration, and the Fundamental Theorem of Calculus. Use of computer technology and laboratory assignments will be required in this course. Prerequisite: MATH 1316 or MATH 2412. Lab fee: $2.

**MATH 2414. Calculus II. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Applications of integration, integration techniques, sequences and infinite series, power series, parametric and polar curves. Use of computer technology and laboratory assignments will be required in this course. Prerequisite: MATH 2413. Lab fee $5.

**MATH 3301. Number Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of congruence relations, rational integers, diophantine equations, quadratic reciprocity law, linear forms, integral domains, and related topics. Prerequisite: 6 hours of Mathematics including MATH 2413.

**MATH 3302. Principles of Geometry. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to Euclidean geometry. Topics will include an introduction to logic, properties of parallel lines, triangles, quadrilaterals, and measurement. Similarity and proportionality will also be addressed. Credit for both MATH 3302 and MATH 4302 will not be awarded. Prerequisite: MATH 2413. Lab fee: $2.

**MATH 3303. Concepts of Elementary Mathematics I. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Problem solving, sets, functions, logic, numerical fluency, concepts of properties of whole numbers, rational numbers, integers, and real numbers. Designed for those planning to teach in elementary school. Prerequisites: minimum of 45 hours complete and a C or better in MATH 1314 Lab fee: $2.

**MATH 3305. Concepts of Elementary Mathematics II. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Basic concepts in algebra, geometry, measurement, probability, data collection, and statistics. Prerequisite: C or better in MATH 3303 Lab fee: $2.

**MATH 3306. Differential Equations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Solutions and applications of homogeneous and nonhomogeneous ordinary differential equations, including first-order equations and higher-order linear equations. Qualitative properties of solutions are investigated, as well as exact methods for solving differential equations and initial value problems including series, Laplace transform, separation of variables, variation of parameters, and undetermined coefficients. Prerequisite: MATH 2414.

**MATH 3310. Discrete Mathematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduces students to the techniques and tools of reasoning, decision making and combinational problem solving. Topics include sets and logic, combinations, probability, relations, functions and graphs, symbolic logic, finite state and Turing machines. Prerequisites: MATH 2413 or concurent enrollment.

**MATH 3311. Probability and Statistics I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will include probability axioms and properties; conditional probability and independence; counting techniques; and discrete, continuous, univariate, and multivariate random variables. Prerequisite: MATH 2414.

**MATH 3320. Foundations of Mathematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to concepts and forms of proof found in advanced mathematics courses. Topics include logic, set theory, mathematical induction, relations, functions, and cardinality. Prerequisites: MATH 2413.

**MATH 3332. Linear Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the theory of real vector spaces and linear transformations. Topics include vector spaces, inner product, norm, distance, subspaces, spanning sets, linear dependence and independence, bases, dimension, linear systems, coordinates, linear transformations, kernel, image, isomorphisms, inverse linear transformations, matrix representations of linear transformations, similarity, direct sums, and canonical forms. Prerequisites: MATH 2414, MATH 2332 and MATH 3320.

**MATH 3360. Numerical Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to numerical analysis. Topics will be selected from error analysis, solving algebraic equations, interpolation, numerical differentiation and integration, methods for solving systems of equations, approximation theory, and initial value problems of ordinary differential equations. Prerequisite: MATH 2414 and 3 hours of COSC.

**MATH 3433. Calculus III. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The calculus of two dimensional vectors, parametric equations, cylindrical and spherical coordinates, multivariable differential calculus, directional derivatives and their applications, multiple integration, vector analysis, line and surface integrals, Green's Theorem, Stokes's Theorem. Use of computer technology and laboratory assignments will be required in this course. Prerequisite: MATH 2414. Lab fee $5.

**MATH 3450. Principles of Bio-Statistics. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
An introduction to statistical methods that are applied in biology and agriculture. Use of technology and hands-on laboratory assignments will be required in this course. This course cannot be counted on a degree program for a mathematics major. Credit cannot be awarded for both MATH 1342 and 3450. Prerequisite: MATH 1314 or MATH 1316 or MATH 2412 or MATH 2413. Lab fee: $2.

**MATH 4086. Mathematics Problems. 1-4 Credit Hours (Lecture: 0 Hours, Lab: 1-4 Hours).**
Special problems in mathematics. Not covered by any course in the curriculum. Work may be either theory or laboratory. May be repeated with approval of the department head for additional credit. Prerequisite: Approval of department head.

**MATH 4088. Undergraduate Research Project. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Methods of research in the mathematical sciences or in mathematics education through a research project directed by a departmental faculty member. The student is required to prepare a final report and presentation. No credit is earned until the student has enrolled in at least 3 credit hours and the final report and presentation are certified as completed by the faculty member directing the project, at which time the student will receive 3 credit hours. Prerequisite: Mathematics major, junior standing, 24 semester hours MATH and department head approval.

**MATH 4302. College Geometry. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Topics will include logic, properties of circles and transformations, projective and non-Euclidean geometry. Technology will be included when appropriate. Credit for both MATH 3302 and MATH 4302 will not be awarded. Prerequisite: MATH 2413 Lab fee: $2.

**MATH 4304. Survey of Mathematical Ideas. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to bring together and supplement the technical material of other mathematics courses to communicate mathematics effectively. Topics in algebra, trigonometry, geometry, statistics, and discrete mathematics will be explored. Technology will be used where appropriate. Prerequisites: MATH 2413 and MATH 3302 or MATH 4302 or concurrent enrollment.

**MATH 4305. Concepts of Elementary Mathematics III. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to develop and extend the mathematical content knowledge of prospective middle school teachers. Topics will include proportionality, elementary number theory, and the development of algebraic reasoning through the use of patterns, relations, and functions, with an emphasis on multiple representations (numerical, graphical, verbal, and/or symbolic). Technology will be integrated into the curriculum where appropriate. Prerequisites: Junior Standing with at least one of the following: C or better in MATH 3305 or MATH 4302 or concurrent enrollment in MATH 4302.

**MATH 4306. Partial Differential Equations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to theory and applications of partial differential equations. Topics for study may include separation of variables, heat equation, Laplace's equation, wave equation, Fourier series, and Sturm-Liouville eigenvalue problems. Prerequisites: MATH 3306.

**MATH 4309. Advanced Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A study of the theory of the calculus of functions of a single variable. Topics include the topology of the real line, functions, sequences and their limits, continuity, differentiation, and analysis of variance. Prerequisite: MATH 2414 and MATH 3320.

**MATH 4311. Probability and Statistics II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will include normal distributions; sampling distributions; the central limit theorem; descriptive statistics; and the theory of statistical estimation and testing, with applications to proportions, means, contingency tables, univariate linear regression, and analysis of variance. Prerequisite: MATH 3311.

**MATH 4320. Mathematical Modeling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced course in mathematical modeling requiring students to build and validate deterministic models of complex phenomena. The course will emphasize both qualitative and quantitative computational techniques of applied mathematics. Prerequisites: MATH 2414 and 6 hours of advanced MATH.

**MATH 4332. Abstract Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The study of preliminary notions, group theory, the theory of rings and ideals, and polynomial rings. Prerequisites: MATH 2414 and MATH 3320.

**MATH 4370. Introduction to the History of Mathematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the historical and philosophical development of the various branches of mathematics. The evolution of mathematical ideas will be studied from their developmental stages to the modern concepts used today. Prerequisites: 6 advanced hours in MATH.

**MATH 4384. Internship. 3 Credit Hours (Lecture: 0 Hours, Lab: 4 Hours).**
The student will complete a supervised and comprehensive work experience in a mathematics-related position with a public or private business organization for career preparation in a mathematics-related enterprise. The work experience must be formally approved and arranged with a cooperating sponsor prior to semester of enrollment in the course, and should be completed within the semester of course enrollment. Oral and written reports of the internship experience will be required. Prerequisite: At least 24 hours of degree-applicable MATH coursework with no grade lower than a 'C' in a MATH course, minimum 2.6 MATH GPA, minimum 2.6 overall GPA, junior or senior classification, and approval of department head.

**MATH 4390. Math Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will be selected from areas of mathematics suitable for upper level study. This course may be repeated once, with department head approval, as topics change. Prerequisite: MATH 2414 and 6 hours of upper level mathematics.

**MATH 5086. Advanced Special Problems in Mathematics. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Special problems in mathematics. Work may be either theory or laboratory. May be repeated with approval of the department head for additional credit. Prerequisite: Approval of department head.

**MATH 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student's committee chair determines the student is ready to begin the thesis. No credit is earned until the student has enrolled in at least 6 credit hours of thesis and the thesis is certified as completed by the student's committee, at which time the student will be awarded 6 credit hours of thesis. Prerequisite: 18 hours of approved graduate credit toward the degree and consent of the student's committee.

**MATH 5198. Research Analysis. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
An overview of the components of research in the main areas of mathematics. These areas will include pure mathematics and statistics, applied mathematics and statistics, and mathematics education. The course will culminate with a study of what is a proper literary review and how to submit an article for publication. Prerequisite: Graduate standing in the mathematics department or approval of the department head.

**MATH 5301. Nonparametric Statistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to nonparametric statistics. Topics will include hypothesis testing, contingency tables, rank tests, and goodness-of-fit tests. Prerequisite: Junior or senior level statistics course.

**MATH 5305. Statistical Models. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers the basics of experimental design, mathematical theory for linear and logistic regression models in the multivariate case, and diagnostics and remedial measures for these models. Other topics will be selected from time series analysis, principle components, canonical correlations, factor analysis, discriminant analysis, and cluster analysis. Prerequisite: MATH 3311.

**MATH 5306. Dynamical Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced study of dynamical systems. Topics will be selected from discrete and continuous dynamical systems, sensitivity analysis, models of the physical, life, and social sciences, and bifurcation analysis. Prerequisite: MATH 3306 and 3332.

**MATH 5308. Abstract Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will be selected from: groups, homomorphism, isomorphism, direct products and sums, invariant properties, rings, and fields. Prerequisite: MATH 4332.

**MATH 5309. Complex Variables. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to complex analysis. Topics will be selected from elementary operations and analytic functions, curves and integrals, power series, Cauchy¿s theorem, zeroes and singularities of analytic functions, Laurent series, maximum principle, analytic continuation, harmonic functions, conformal mapping and transformations. Prerequisite: MATH 2414 or approval of department head.

**MATH 5311. Operations Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the theoretical support and applications of the simplex algorithm for linear programming and for dynamic programming. Transportation and scheduling problems are among the applications to be emphasized. Prerequisite: MATH 3332.

**MATH 5312. Design of Experiments. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will learn about planning and conducting an experiment. Data analysis using appropriate software is covered. Prerequisite: MATH 5305 or approval of department head.

**MATH 5320. Real Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics will be chosen from: sets and operators; cardinal numbers and ordinal types; metric spaces and Lebesque measure; metric properties of sets; differentiation and integration. Prerequisite: MATH 4309.

**MATH 5330. Mathematical Modeling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced course in mathematical modeling. Topics will be selected from scaling, dimensional analysis, regular and singular perturbation theory, stability theory, and asymptotic analysis. Prerequisites: MATH 3306, 3332.

**MATH 5340. Topology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to point set topology. Topics will include open and closed sets, interior, closure, boundary, neighborhoods, continuous functions, separation and subspaces. Additional topics will be selected from compactness, connectedness and continua. Prerequisite Course(s): MATH 4309.

**MATH 5350. Linear Algebra. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced course in linear algebra. Topics to be selected from linear spaces and operators, canonical forms, quadratic forms and optimization, computation and condition, and compatible systems. Prerequisite: MATH 3332.

**MATH 5360. Numerical Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study of numerical analysis. Topics will be selected from linear systems, approximation theory, numerical differential and integral equations, integration theory. Prerequisite: MATH 3360.

**MATH 5362. Data Warehousing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Use SQL for manipulation and exploration of large data sets by creating tables, transforming data, using joins, and performing simple queries. Prerequisites: COSC 1310 or equivalent.

**MATH 5364. Data Mining I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course centers on the identification, exploration, and description of new patterns contained within data sets using appropriate software. Selected topics will be chosen from data exploration, classification, cluster analysis, and model evaluation and comparison. Prerequisites: MATH 3311.

**MATH 5366. Data Mining II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course centers on the identification, exploration, and extraction of new patterns from natural language text documents using appropriate software. Selected topics will be chosen from association analysis, anomaly detection, text mining, dimensionality reduction, and model evaluation and comparison. Prerequisites: MATH 5364.

**MATH 5370. History of Mathematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A historical and philosophical development of mathematics from earliest times down to the present. Mathematical topics are presented in a historical and philosophical setting not only to provide a unifying theme, but also to illustrate how the evolution of mathematical ideas finally led to modern concepts in the field. Students having prior credit for History of Mathematics will not receive credit for MATH 5370. Prerequisite: 6 advanced hours in MATH.

**MATH 5371. Euclidean and Non-Euclildean Geometries. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on important geometric concepts of Euclidean and non-Euclidean geometries from an axiomatic perspective. Technology will be included where appropriate. Prerequisite: 3 hours of undergraduate geometry.

**MATH 5373. Theory of Functions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to emphasize the role of function as the key unifying concept of mathematics and to extend the understanding of the structural foundations of mathematics. The properties of various families of functions will also be studied. Prerequisite: 24 hours of MATH, including MATH 2413. Course fee $15.

**MATH 5375. Statistical Reasoning and Probability. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on statistical reasoning and decision making by extending the elements of probability and statistics introduced in an undergraduate course. Topics may include probability theory, distribution functions, statistical inference, sampling methods, regressional analysis, and ANOVA. Technology will be incorporated where appropriate. Prerequisite: 3 hours of undergraduate statistics.

**MATH 5376. Topics in Secondary Mathematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course applies the standards of the National Council of Teachers of Mathematics to the curriculum of secondary mathematics. It explores techniques to implement the standards through the use of manipulatives, graphing handhelds, and computer technology. Prerequisite: 24 hours of MATH, including MATH 2413.

**MATH 5377. In-Depth Mathematical Reasoning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of mathematics from an advanced perspective, taking into account not only the interconnections among topics but their relationship to higher mathematics. Important new mathematical insights and understandings will be revealed in its structure and its applicability. The focus will be on concept analysis, problem analysis, and mathematical connections as well as mathematical habits of mind. Prerequisite: 24 hours from MATH, including MATH 2413.

**MATH 5378. Technology-Aided Mathematics-. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will engage in mathematical problem-solving using technological tools. Technologies may include graphing handhelds, data collection devices, computer software packages, and internet resources. This course may be repeated for credit as the topic changes. Prerequisite: 24 hours of MATH, including MATH 2413.

**MATH 5379. Trends and Issues in Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In this seminar-style course, students have a forum for discussion and presentation of inquiries into the history, current trends, and issues pertaining to analysis of research trends in mathematics education and its effect on policy, curriculum, and the teaching and learning of mathematics. Prerequisite: 24 hours of MATH, including MATH 120.

**MATH 5380. Selected Topics in Mathematical Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of topics in mathematical theory appropriate for secondary mathematics educators. Topics will be selected from geometry and topology, number theory, modern algebra, and library research in mathematics. This course may be repeated for credit as the topic changes. Prerequisite: Approval of department head.

**MATH 5390. Selected Topics in Mathematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of topics in applied mathematics. Topics for study will be selected from advanced mathematical modeling, advanced numerical techniques, practical optimizations, calculus of variations, dynamic programming, integral equations, optimal control, perturbation methods, and library research in applied mathematics. This course may be repeated for credit as the topic changes. Prerequisite: Approval of department head.

**MATH 5699. Internship. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
The student will complete a supervised and comprehensive work experience in a mathematics-related position with a public or private business organization for career preparation in a mathematics-related enterprise. Credit in this course does not count towards the 24 hour requirement for the M.S. in Mathematics. Prerequisite: Mathematics graduate student with department head approval. Field assignment fee $75.

# Mechanical Engineering

## Courses

**MEEN 2115. Engineering Computer Aided Manufacturing. 1 Credit Hour (Lecture: 1 Hour, Lab: 2 Hours).**
This is a fundamental course that demonstrates the integration of Computer-Aided-Design (CAD) and Computer-Aided-Manufacturing (CAM), and examines how to program and operate Computer Numerical Control (CNC) mills and lathes. It is a study of modern prototyping and machining methods, with emphasis on teaching the use of CAM software. This program converts 2D and 3D CAD drawing geometry directly into tool path information that is used to drive numerically-controlled turning and milling machines. Prerequisite: MEEN 2210 (prereq); MATH 2413 (coreq).

**MEEN 2210. Engineering Computer Aided Design. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Fundamentals of engineering design and solid modeling using computer aided drafting tools; application of solid modeling, analysis and simulation software and 3-D printing to problem solving and design. Prerequisite: ENGR 1212(coreq); MATH 2413(coreq) Lab fee: $2.

**MEEN 2310. Engineering CAD/CAM. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Application of solid modeling, analysis and simulation software and 3-D printing to problem solving and design. Fundamentals of engineering design and solid modeling using computer-aided drafting tools. Standard terminologies, conventions, processes, operations, design and operational characteristics of key hardware components, programming techniques, applications, merits and demerits of Computer Numerical Controlled (CNC) machines. Prerequisite: ENGR 1212; MATH 2413 or concurrent registration Lab fee: $2.

**MEEN 3305. Fluid Mechanics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is an introduction to fluid mechanics, and emphasizes fundamental concepts and problem-solving techniques. Topics to be covered include fluid properties, fluid statics, fluid kinematics, control volume analysis, dimensional analysis, internal flows (pipe flows), and external flows (lift and drag). Brief introductions to computational fluid dynamics (CFD), compressible flow, and fluid power systems such as turbomachinery (pumps and turbines) will also be provided. Prerequisite: PHYS 2425, MATH 2414, ENGR 2322.

**MEEN 3310. Design for Manufacturability. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
System-level design optimization including manufacturing, assembly, testing and service. Includes materials and manufacturing process selection. Prerequisites: MEEN 2210, CVEN 3423, ENGR 2321, and ENGR 2324 Lab fee: $2.

**MEEN 3314. Signals and Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Modeling and analysis of electrical and mechanical systems using Laplace transformation methods; transient and steady-state analysis; Fourier series; Fourier transform; elementary feedback. Prerequisite: ELEN 2425, MATH 3306 or concurrent registration.

**MEEN 3325. Advanced Thermodynamics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Design of power and refrigeration systems, mixing or separation, multiphase, air conditioning and energy conversion processes; engine design and operating parameters dealing with thermo-chemistry of fuel air mixtures; properties of working fluids; power cycle analysis with thermodynamic properties and working fluids. Prerequisites: ENGR 2322, CHEM 1409, and MATH 3306 (coreq).

**MEEN 3335. Mechanical Vibration. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Modeling, analysis and design for mechanical vibrations. Fundamentals of free vibration, harmonically excited vibration and vibration under general forcing conditions for one degree and multidegree of freedom systems; vibration design strategies including isolation and absorbers; analysis of mechanical systems for stability, resonance, damping, and modal coupling. Prerequisite: ENGR 2324, CVEN 3423, MATH 3306 Lab fee: $2.

**MEEN 3345. Heat Transfer. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Heat transfer by conduction, convection, and radiation; steady-state and unsteady heat conduction; free and forced convection heat transfer; radiative heat transfer; heat exchanger analysis. Prerequisite: ENGR 2322, MEEN 3305, MATH 3306.

**MEEN 3350. Measurement System Design. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Design of measurement systems including hardware and software specifications, design, prototyping and testing. Includes fundamentals of data acquisition, design of experiments, instrumentation and sensor calibration commonly used in industry and research (e.g., sensors, signal conversion and conditioning, and wireless data communications). Prerequisite: ELEN 3314, MEEN 2210, PHYS 2426 Lab fee: $2.

**MEEN 3400. Fluid Mechanics. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Perform analyses involving hydrostatics, fluid dynamics, pipe flow, open-channel flow, pumps, and dimensional analysis. Design and conduct fluid mechanics experiments. Perform computer simulations of fluid processes. Prerequisites: PHYS 2425 and MATH 2414 Lab fee: $2.

**MEEN 3440. Heat Transfer. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Steady and transient conduction in one- and two-dimensions; forced and natural convection; radiation; phase change; basic heat exchangers design; elements of thermal system design. Includes an introduction to computational analysis of heat transfer and temperature distributions and laboratory experiences. Prerequisite: ENGR 2322 Lab fee: $2.

**MEEN 4086. Special Problems. 1-4 Credit Hours (Lecture: 1-4 Hours, Lab: 1-4 Hours).**
Directed study of selected topics in Mechanical Engineering. May be repeated with approval of department head.

**MEEN 4205. Mechanical Engineering Experimental Lab. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Experimentation and measurements in fluid mechanics and heat transfer; efficiency analysis; design of experiment; data processing and analysis; report writing. Prerequisite: MEEN 3305, MEEN 3345 Lab fee: $2.

**MEEN 4300. Renewable Energy Systems and Applications. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Study of renewable energy sources, future demands, energy management and conservation techniques with focus on sources such as solar energy, biomass (conversions), wind power, geothermal energy, ocean energy, fuel cells and hydro power; assessing the viability of renewable energy systems; and analysis of renewable energy systems, applications, backup energy needs and economic factors. Prerequisites: MEEN 3325, MEEN 3305, MEEN 3345.

**MEEN 4310. Mechanical Engineering Design I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Application of principles of mechanics and physical properties of materials, stress fundamentals and failure theories to the design, selection and analysis of linear elastic solid materials in machine elements with consideration of economics, safety and design for manufacturing. Prerequisite: MEEN 2210, MEEN 2115, CVEN 3423, ENGR 2324.

**MEEN 4320. Mechanical Engineering Design II. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Modeling, analysis and design of machine elements such as springs, bearings, gears, shafts, and mechanisms based on extensive application of physics, mathematics, core engineering principles and industrial practice; design for optimal manufacturability, quality and reliability in the mechanical engineering practice of design. Prerequisite: MEEN 4310, MEEN 3305 Lab fee: $2.

**MEEN 4420. Thermal-Fluid System Design. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Application of thermodynamics, heat transfer and fluid mechanics concepts to the analysis and design of thermal-fluid systems. Emphasis on component and system modeling, energy balances, performance measurements and experimental design. Prerequisite: ENGR 2322, MEEN 3305, MEEN 3345 Lab fee: $2.

**MEEN 4425. Mechatronics. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The study and design of electromechanical devices including comprehensive principles from mechanics, electronics, instrumentation and software; includes sensors, control systems and actuators along with how to choose a proper controller for mechanical engineering design problems. Prerequisites: ELEN 2425, MEEN 4310; ELEN/MEEN 4443 Lab fee: $2.

**MEEN 4443. Linear Control Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Application of state variable and frequency domain techniques to modeling and analysis of single input, single output linear control systems; physical implementation of control systems by integrating sensors, actuators and other control system components; use of software design tools. Prerequisite: ELEN 2425, ELEN 3320 or COSC 3344, MATH 3306. Lab fee: $2.

# Management

## Courses

**MGMT 3300. Principles of Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the basic managerial functions of planning, organizing, leading, and controlling resources to accomplish organizational goals. Management theories and the business environment are also covered.

**MGMT 3302. Human Resource Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamental functions of human resources management; relationship between personnel management and organizations' emerging role of personnel administration in development of strategic policy for organizations.

**MGMT 3303. Supervisory Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Investigates the role, function, and responsibilities of the supervisor in modern organizations through study of sociological and psychological theories in human relations. The primary emphasis is on development of supervisory skills in communications, motivation, discipline, morale, and grievances as they arise in superior-subordinate relationships.

**MGMT 3304. Small Business Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Oriented toward planning for and managing a small business, starting a business, and buying a business franchise. May include computer simulation and consultation for actual small business. Prerequisites: Approval of the instructor and department head to enroll in the course.

**MGMT 3325. Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced studies of contemporary leadership issues; the history of leadership; leadership theories; leadership ethics and values; group dynamics; organizational behavior; methods of effective team building; community activism; the politics of gender, race, disability, and age; the dynamic of power; and the aspect of professional networking. Course will include in depth study of above mentioned topics, as well as extensive discussion and research of related leadership issues.

**MGMT 3350. Organization Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides a comprehensive analysis of the behavior of people at work in all types of organizations. Topics include fundamentals of organizational behavior: values, ethics, motivation, group dynamics, individual differences, attitudes, decision-making, conflict, power, change, stress, leadership, rewarding behavior, communication, and organizational structure.

**MGMT 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a management related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of Instructor and Department Head.

**MGMT 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in management. May be repeated with department head approval. Prerequisites: Approval of Instructor and Department Head.

**MGMT 4090. Special Topics in Management. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An examination of current topics in management. Readings required from current management publications and other related periodicals. May be repeated for credit when topics vary. Prerequisite: 9 hours in MGMT.

**MGMT 4302. Creating Productive Relationships. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A practical and theoretical course dealing with behavior. Emphasis will be on identifying and classifying behavior in order to better understand behavior and to develop strategies for effectively managing interpersonal relationships. Exercises and role playing are used to illustrate major points. Materials fee required.

**MGMT 4303. Strategic Compensation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Wage and salary administration in public and private organizations; determinants of general wage and salary levels and structures; total compensation systems, interrelationship among employee performance, intrinsic and extrinsic rewards, perceived equitable payments, employee satisfaction. Prerequisite: MGMT 3302.

**MGMT 4304. Staffing Organizations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Recruitment and selection of human resources for organizations; optimal utilization of human resources within organizations; use of tests and other techniques in human resource management. Prerequisite: MGMT 3302.

**MGMT 4305. Human Resource Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Practical and theoretical approaches to training and development of employees in an organization. Topics include organization, role and scope, training and development functions, philosophies, strategies, need analysis, development of program content, methods, materials and techniques, and evaluation and control of the training and development function.

**MGMT 4306. Employee and Labor Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Collective bargaining, labor market fundamentals, unionism, and related issues of labor economics.

**MGMT 4307. Business Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An analysis and examination of significant contemporary ethical issues and problems existing throughout the professional business arena. Emphasis will be upon the manager's social and environmental responsibilities to employees, customers, and the public.

**MGMT 4312. Entrepreneurship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Addresses the process of generating ideas for new business, writing comprehensive business plans. Emphasis on information sources, industry analysis.

**MGMT 4321. Production and Operations Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics covered include: industrial organization, scientific management, planning and control, building locations and layouts, wage rates, corporation relationships, and research. Prerequisite: BUSI 2311 or concurrent enrollment.

**MGMT 4354. International Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A global approach to the study of management to include international dimensions of the marketplace and environment, the role of culture, international strategic management, organizational behavior and human resource management.

**MGMT 4385. Seminar in Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Deals with current issues in management. Readings are required from current management publications and other related periodicals. May be repeated for credit when topics vary. Prerequisites: 15 hours in MGMT and approval of department head.

**MGMT 4389. Global Management Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of basic international business concepts, cultural literacy, and discipline specific content are then applied to practical experiences and activities in the foreign country visited. A study abroad at the student's expense is required. Student may complete a maximum of six hours of COBA sponsored study abroad toward degree completion.

**MGMT 5086. Problems. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
This course offers students the opportunity to study management topics and perform research within the student's area of interest as directed by the responsible professor. Prerequisite: Approval of the department head.

**MGMT 5301. Organizational Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Behavioral theory in organizational context. A study of individual and group dynamics in the business environments. Specific emphasis is given to leadership, motivation, communication, employee supervision, and morale in all organizational settings.Credit will not be awarded for both MAPA 5301 and MGMT 5301.

**MGMT 5306. Influencing Organizational Productivity through Interpersonal Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A practical and theoretical course dealing with interpersonal behavior and its influence on organizational productivity. Emphasis will be on identifying and classifying behavior in order to better understand behavior and to develop strategies for creating productive relationships with others. Particular emphasis is directed toward the impact of interpersonal behavior in business organizations and the potential effect on productivity. Materials fee required.

**MGMT 5307. Responsibilities and Ethics of Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of an organization's social and environmental responsibilities to its employees, customers, and the general public. Practical emphasis is given to the case study method for evaluating the performance of various organizations. Establishes a theoretical framework for understanding ethics, principles and values of leadership as they affect the organization, the organizational environment and society.

**MGMT 5310. Leadership Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Leadership is explored through the process of developing oneself as a leader while developing followers. Emphasis is placed upon learning the skills necessary to lead through the ethical use of influence in order to achieve organizational strategic goals.

**MGMT 5311. Managing Operations and Services. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of concepts, models and methods used to effectively manage the manufacturing and/or service operations of for-profit and not-for-profit organizations. Emphasis will be placed on the design and use of cross-functional operations planning, control, and support systems. Topics of contemporary relevance will be examined to include supply chain management, enterprise resource planning, time-based competition, and quality improvement.

**MGMT 5312. Project Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Project Management is a growing field in many disciplines from manufacturing to marketing and from technology to training. Students will plan, document, and execute a simulated or real project while learning the principles and practices of project management.

**MGMT 5354. International Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Coverage of the management issues corporations face when doing business internationally. Topics include the impact of culture, role of international relations, ethical decision-making, international strategic management, organizational behavior and human resource management.

**MGMT 5368. Organizational Development and Change. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study, research and analysis of pro-active strategies for organizational change using the theories and techniques of applied behavioral science. Examines the phases of consulting, strategies, intervention decisions and actions, multiple roles, skills and phases of internal and external consultants, ethical dilemmas and guidelines and the implementation of action research. A complete, step-by-step, intervention strategy is developed during this course.

**MGMT 5388. Thesis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisite: Approved research methodology course and approval of instructor of record.

**MGMT 5389. Global Management Practices. 3 Credit Hours (Lecture: 4.5 Hours, Lab: 0 Hours).**
A study of basic international business concepts, cultural literacy, and discipline specific content are then applied to practical experiences and activities in the foreign country visited. A study abroad at the student's expense is required. Student may complete a maximum of six hours of COBA sponsored study abroad toward degree completion. Prerequisites: Admission into a COBA graduate program and permission of the instructor.

**MGMT 5391. Management Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics of current importance to management. May be repeated for credit when topics vary.

**MGMT 5395. Internship. 3 Credit Hours (Lecture: 1 Hour, Lab: 8 Hours).**
Prepared and supervised work experience in a management-related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of MBA Director. Field experiences fee $50.

# Marketing

## Courses

**MKTG 2314. Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of the principles and concepts of marketing goods, services, and intangibles by profit and non-profit organizations in a free enterprise and global economy.

**MKTG 3312. Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of the principles and concepts of marketing goods, services, and intangibles by profit and non-profit organizations in a free enterprise and global economy.

**MKTG 3315. Personal Selling. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the role and function of personal selling as a part of the marketing mix. Techniques in identifying and locating prospective customers, approaching the prospect, presentation, and demonstrations of products and services, closing the sale, and servicing customer accounts are covered in theory and practice. Prerequisite: MKTG 2314 or MKTG 3312.

**MKTG 3316. Consumer Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Acquaints students with individual and group behavior of people performing in consumer role. Considers such topics as buying motives, social class, and research techniques in consumer behavior. Prerequisite: MKTG 2314 or MKTG 3312.

**MKTG 3317. Retailing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamental operations of retailing, studying of buying practices, pricing, store locations and layout, sales promotions, personnel management, and stock control. Designed to aid the student seeking a general knowledge of the retail field as well as those specializing in Marketing. Prerequisite: MKTG 2314 or MKTG 3312.

**MKTG 3318. Promotional Strategy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of a controlled, integrated program of promotional variables. Designed to present a company and its products to prospective customers; to promote need-satisfying attributes of products toward the end of facilitating sales and long-run performance. Prerequisite: MKTG 2314 or MKTG 3312.

**MKTG 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a marketing related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Either MKTG 2314 or MKTG 3312, and approval of Department Head.

**MKTG 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in marketing. May be repeated with approval of the department head. Prerequisites: Approval of instructor and Department Head.

**MKTG 4090. Special Topics in Marketing. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
An examination of current topics in marketing. Readings required from current marketing publications and other related periodicals. May be repeated for credit when topics vary. Prerequisite: 9 hours of MKTG.

**MKTG 4302. Services Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduce the student to the service environment. An in-depth analysis of the most successful service-oriented industries and firms within the world's fastest-growing economic sector will be presented. Prerequisite: MKTG 2314 or MKTG 3312.

**MKTG 4312. Sales Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Administration of an effective sales force, including strategy, planning, recruiting, training, motivating, coordinating, leading, and directing sales forces at all levels of marketing enterprises. Prerequisites: Either MKTG 2314 or MKTG 3312, and MKTG 3315.

**MKTG 4314. Supply Chain and Logistics Concepts. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explore key business concepts, issues and decisions required for the organization and management of supply chains within the global marketplace. Supply Chain Management involves planning and coordinating the value-added activities and flow of materials, finished goods and information. Supply chain organizations participate in the product fulfillment process so that products are distributed to customers in the right quantity, time, and at the lowest cost subject to customer expectation and other service requirements. Prerequisite: MKTG 2314 or MKTG 3312.

**MKTG 4315. Marketing Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Familiarizes students with the accurate, objective, and systematic gathering, recording, and analyzing of data about problems relating to marketing goods and services. Prerequisites: Either MKTG 2314 or MKTG 3312, and either BUSI 2311 or BUSI 3311.

**MKTG 4316. Marketing Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The application of strategic planning and management of all functional aspects of the marketing operation of an enterprise using comprehensive analytical methods and an integrated marketing mix. Prerequisites: Either MKTG 2314 or MKTG 3312, and 6 hours of upper level MKTG.

**MKTG 4354. International Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A global approach to the study of comparative marketing systems, including economic, social, technological, governmental, and political environments as they affect international marketing operations. Prerequisite: MKTG 2314 or MKTG 3312.

**MKTG 4385. Seminar in Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of selected topics dealing with problems or unique needs of Marketing. May be repeated for credit as topics vary. Prerequisite: Approval from instructor & department head.

**MKTG 4389. Global Marketing Practices. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of basic international business concepts, cultural literacy, and discipline specific content are then applied to practical experiences and activities in the foreign country visited. A study abroad at the student's expense is required. Student may complete a maximum of six hours of COBA sponsored study abroad toward degree completion. Field assignment fee of $50. Prerequisites: Either MKTG 2314 or MKTG 3312, or approval of instructor and department head.

**MKTG 5086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
This course offers students the opportunity to become acquainted with current research being conducted within the student's area of interest; directed reading of a number of sources selected in concert with the student's professor. Prerequisite: Approval of department head.

**MKTG 5303. NonProfit & Public Sector Marketing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will examine the role and application of marketing in public and nonprofit settings. The course focuses on a conceptual understanding of the marketing discipline and marketing processes and shows how basic concepts and principles of marketing are applicable to public and nonprofit organizations.

**MKTG 5308. Marketing Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of the planning and coordination of marketing functions specifically related to product, pricing, promotion, and distribution strategies. Includes case analysis and presentation of results. Prerequisite: MGMT 5300 or approval of department head.

**MKTG 5309. Marketing Strategy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Develops the role of product, pricing, promotion, and channel and physical distribution in the development of a firm's integrated marketing program. Cases are used to evaluate and compose alternative courses of action.

**MKTG 5354. International Marketing. 3 Credit Hours (Lecture: 4.5 Hours, Lab: 0 Hours).**
A global approach to the study of comparative marketing systems, including economic, social, technological, governmental, and political environments as they affect international marketing operations. Graduate students will be required to complete an extensive research project in addition to other course requirements.

**MKTG 5389. Global Marketing Practices. 3 Credit Hours (Lecture: 4.5 Hours, Lab: 0 Hours).**
A study of basic international business concepts, cultural literacy, and discipline specific content are then applied to practical experiences and activities in the foreign county visited. A study abroad at the student¿s expense is required. Graduate students will be required to complete an extensive research project in addition to other course requirements. Student may complete a maximum of six hours of COBA sponsored study abroad toward degree completion. Prerequisites: Admission into a COBA graduate program and permission of the instructor.

**MKTG 5391. Marketing Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics of current importance to marketing. May be repeated for credit when topics vary.

# Medical Laboratory Technician

## Courses

**MLAB 2182. Introductory Skills for Medical Laboratory Science. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
An introductory course in the medical laboratory sciences program that includes basic laboratory safety practices, computer applications, lab mathematics, quality control and basic laboratory equipment. This course must be taken during the first semester of enrollment on the MLT and HT certification programs. Course fee $25.

**MLAB 2193. MLT Field Practicum III. 1 Credit Hour (Lecture: 0 Hours, Lab: 7 Hours).**
Structured supervised work-based instruction that helps students gain practical experience, enhance skills and integrate knowledge in microbiology and urinalysis.

**MLAB 2194. MLT Field Practicum I. 1 Credit Hour (Lecture: 0 Hours, Lab: 7 Hours).**
Structured supervised work-based instruction that helps students gain practical experience, enhance skills and integrate knowledge in blood bank, serology and automation.

**MLAB 2195. MLT Field Practicum II. 1 Credit Hour (Lecture: 0 Hours, Lab: 7 Hours).**
Structured supervised work-based instruction that helps students gain practical experience, enhance skills and integrate knowledge in chemistry and hematology.

**MLAB 2214. Introduction to Urinalysis. 2 Credit Hours (Lecture: 1 Hour, Lab: 5 Hours).**
An introduction to urinalysis and body fluid analysis, including the anatomy and physiology of the kidney, and physical, chemical and microscopic examination of urine, cerebrospinal fluid, and other body fluids. Lab fee $2.

**MLAB 2228. Coagulation. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A course in coagulation theory, procedures, and practical applications. Includes laboratory exercises which rely on commonly performed manual and semi-automated methods.

**MLAB 2285. Advanced Topics and Capstone Review. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course examines the integration of all areas/concepts of the laboratory and correlates laboratory test data with diagnostic applications and pathophysiology using critical thinking skills. This course includes a capstone examination and may only be taken during the last semester of the MLT/HT programs.

**MLAB 2292. MLT Field Practicum IV. 2 Credit Hours (Lecture: 0 Hours, Lab: 14 Hours).**
Structured, supervised work-based instruction that helps students gain practical experience in the clinical laboratory. Opportunities are centered in the rural health setting. Course must be taken in the last semester of the MLT program.

**MLAB 2364. Introduction to Immunology-Serology. 3 Credit Hours (Lecture: 2 Hours, Lab: 4 Hours).**
An introduction to the theory and application of basic immunology, including the immune response, principles of antigen-antibody reactions, and principles and techniques of serologic procedures. Lab fee $2.

**MLAB 2424. Introduction to Hematology. 4 Credit Hours (Lecture: 2 Hours, Lab: 6 Hours).**
Introduction to the theory and practical application of routine procedures, both manual and automated. Red blood cell and white blood cell physiology, morphology (normal and abnormal), maturation sequences and associated diseases are included. Lab fee $2.

**MLAB 2444. Introduction to Immunohematology. 4 Credit Hours (Lecture: 2 Hours, Lab: 8 Hours).**
A study of blood group antigens and antibodies. Performance of routine blood banking procedures, including blood group and Rh typing, antibody screens, antibody identification, cross matching, elution and absorption techniques. Lab fee $2.

**MLAB 2474. Laboratory Operations. 4 Credit Hours (Lecture: 2 Hours, Lab: 7 Hours).**
An intermediate course in the clinical laboratory sciences that includes the principles of laboratory instrumentation and automation, quality control concepts, point of care testing and phlebotomy. Supervised laboratory experiences in instrument operation, calibration and maintenance, and point of care testing and phlebotomy. Lab fee $2.

**MLAB 2534. Introduction of Medical Microbiology. 5 Credit Hours (Lecture: 4 Hours, Lab: 5 Hours).**
Instruction in the theory, practical application and pathogenesis of clinical microbiology, including specimen collection, processing, identification, susceptibility testing and reporting procedures. Lab fee $2.

**MLAB 2576. Introduction to Clinical Chemistry. 5 Credit Hours (Lecture: 3 Hours, Lab: 8 Hours).**
An introduction to the principles and procedures of various tests performed in clinical chemistry. Presents the physiological basis for the test, the principle and procedure for the test and the clinical significance of the test results including quality control and normal values. Also includes basic chemical laboratory techniques and safety for electrolytes, acid-base balance, proteins, carbohydrates, lipids, enzymes, metabolites, endocrine function, therapeutic drug monitoring, and toxicology. Lab fee $2.

# Medical Laboratory Sciences

## Courses

**MDLS 1100. Transitioning to University Studies in Health Professions. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, and in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. Also included will be the development of skills to promote physical and mental health.

**MDLS 1111. Surv Allied Health Prof. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Course description is needed.

**MDLS 4086. Clinical Laboratory Science Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course open by invitation to capable Clinical Laboratory Science students who wish to pursue a selected problem study. Students are permitted and encouraged to work independently under the guidance of an instructor. May be repeated for credit, subject to the approval of the department head. Lab fee $2.

**MDLS 4091. Integrated Clinical Laboratory Practice and Research. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 5-15 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An integrated clinical laboratory course designed to introduce the concepts of specimen tracking and processing using a laboratory information system, test result utilization, utilization review, and clinical research. Emphasis will be placed on workload organization; quality control evaluation accuracy; consistency; validity of results generated; and appropriate reporting of results. Lab fee: $2.

**MDLS 4092. Clinical Laboratory Practicum I. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 5-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in hematology, hemostasis, and body fluid analysis. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4093. Clinical Laboratory Practicum II. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 8-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in medical microbiology and parasitology. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4094. Clinical Laboratory Practicum III. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 8-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in immunology, serology, and blood banking. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4095. Clinical Laboratory Practicum IV. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 8-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work and solving problems in clinical chemistry, toxicology, and molecular pathology. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4096. Advanced Clinical Practicum. 1-8 Credit Hours (Lecture: 0 Hours, Lab: 3-24 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in the clinical laboratory. Emphasis is given to high complexity testing. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4104. Clinical Correlations and Capstone Review Specialty. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course employs an integrative approach to laboratory medicine with emphasis on the review of patient cases and appropriate utilization of laboratory tests in diagnosis and case management. A comprehensive review and assessment of the concepts in a specialty area of medical laboratory medicine. Prerequisite: Acceptance to Public Health Microbiology Categorical Certification program.

**MDLS 4114. Urinalysis and Renal Physiology. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A study of renal physiology, the formation of urine, and the relationship to renal and other systemic diseases. Co-Requisite: MDLS 4115 or approval of department head.

**MDLS 4115. Urinalysis Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised learning experiences using microscopic, chemical, and automated techniques in analysis of urine. Lab fee $2. Co-Requisite: MDLS 4114 or approval of department head.

**MDLS 4116. Body Fluids Analysis. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Advanced concepts related to the biochemical and cellular analysis of body fluids. Includes normal physiologic function and pathophysiology of synovial, semenal, cerebrospinal, serous, and amniotic fluid.

**MDLS 4125. Hematology I Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised experiences with emphasis placed on the enumeration, morphology and staining characteristics of normal blood cells. Manual and automated techniques will be used. Emphasis will be placed on specimen collection, processing, and generation and evaluation of diagnostic data. Lab fee $2. Co-Requisite: MDLS 4224 or approval of department head.

**MDLS 4127. Hematology II Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised experiences with emphasis placed on the enumeration, morphology, and staining characteristics of abnormal blood cells. Emphasis will be placed on specimen processing and generation and evaluation of diagnostic data. Lab fee $2. Prerequisite: MDLS 4125 or approval of department head. Co-Requisite: MDLS 4226 or approval of department head.

**MDLS 4128. Hemostasis. 1 Credit Hour (Lecture: 1 Hour, Lab: 2 Hours).**
Discussion and comparison of the hemostatic coagulation and fibrinolytic systems with emphasis on normal and abnormal physiology. Supervised learning experiences with emphasis on analytes to evaluate coagulation and fibrinolysis. Manual and automated techniques will be discussed and used. Prerequisite: MDLS 4224 and MDLS 4125 or approval of department head.

**MDLS 4135. Medical Microbiology I Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised experience with emphasis on isolation by staining, cultural, and differential biochemical characteristics of pathogenic microorganisms. Lab fee $2. Co-Requisite:MDLS 4234 or approval of department head.

**MDLS 4137. Medical Microbiology II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised experience with emphasis on staining, isolation, identification, and antimicrobial susceptibility testing of microorganisms isolated from clinical specimens. Emphasis is also placed on specimen processing and generation and evaluation of diagnostic data. Lab fee $2. Prerequisite: MDLS 4135 or approval of department head. Co-Requisite: MDLS 4236 or approval of department head.

**MDLS 4138. Medical Mycology and Virology. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Discussion of the epidemiology and pathogenesis of fungi and viruses implicated in human disease. Emphasis will be placed upon diagnostic tools used in the clinical laboratory to isolate, culture, and identify these microorganisms.

**MDLS 4145. Immunohematology I Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 4 Hours).**
Supervised experiences related to blood grouping and typing and compatibility testing. Emphasis is placed on specimen processing and generation and evaluation of diagnostic data. Lab fee $2. Co-Requisite: MDLS 4244 or approval of department head.

**MDLS 4147. Immunohematology II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 4 Hours).**
Supervised experiences related to antibody detection and identification, incompatibility and transfusion reaction resolution; component processing and storage; and selection for therapy. Emphasis is placed on specimen processing, laboratory techniques, and generation and evaluation of diagnostic data. Lab fee $2. Prerequisite: MDLS 4145. Co-Requisite: MDLS 4246.

**MDLS 4148. Introduction to Medical Genetics. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An introduction to the concepts of gene structure and inheritance patterns. Emphasis will be placed on the types of inheritance patterns associated with different disease conditions in which clinical diagnostics plays a valuable role in disease diagnosis or patient counseling.

**MDLS 4151. Clinical Parasitology Lecture. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Discussion of parasites causing disease in humans and their life cycles, identification, and pathology in humans. Opportunistic parasites in the immunocompromised host will also be addressed.

**MDLS 4152. Clinical Parasitology Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised experiences in the identification of human parasites. Specimen collection, processing and criteria for rejection will also be addressed. Emphasis will be placed on deriving diagnostic laboratory results and evaluation of those results. Lab fee $2.

**MDLS 4164. Immunology and Serology I Lecture. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Discussion of immunological mechanisms fundamental to resistance to disease with emphasis on basic humoral and cellular immune response and resistance to microbial disease. Co-Requisite: MDLS 4165.

**MDLS 4165. Immunology and Serology I Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
Supervised laboratory experience with emphasis on the detection, identification, and characterization of antigens and antibodies of infectious etiology using serologic techniques. Emphasis is placed on specimen processing and generation and evaluation of diagnostic data. Lab fee $2. Co-Requisite: MDLS 4164.

**MDLS 4166. Immunology and Serology II Lecture. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Discussion of immunologic mechanisms and pathogenesis involved in autoimmune, allergic, and immunodeficient diseases. Prerequisite: MDLS 4164. Co-Requisite: MDLS 4167.

**MDLS 4167. Immunology and Serology II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
Supervised learning experience with emphasis on the detection, identification, and characterization of antigens and antibodies involved in autoimmune disease. Also emphasis on cells involved in cellular immunity using immunologic techniques. Emphasis is placed on specimen processing and generation and evaluation of diagnostic data. Lab fee $2. Prerequisite: MDLS 4165. Co-Requisite: MDLS 4166.

**MDLS 4174. Introduction to Laboratory Safety and Instrumentation. 1 Credit Hour (Lecture: 1 Hour, Lab: 2 Hours).**
Introduction to the theories and principles of instrument operation and safety practices commonly used in the clinical laboratory. Supervised learning experience in instrument operation and troubleshooting.

**MDLS 4175. Advanced Laboratory Automation, Statistics, and Quality Assurance Concepts. 1 Credit Hour (Lecture: 12 Hours, Lab: 0 Hours).**
Discussion and comparison of operating principles of automated analyzers, complex laboratory techniques, statistical methods and quality assurance concepts applicable to the clinical laboratory. Supervised learning experience in instrument operation, troubleshooting, electrophoresis and chromatography. Application of statistics to quality assurance and evaluation of laboratory results will be discussed.

**MDLS 4177. Clinical Chemistry I Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised learning experiences with emphasis on manual, semi-automated, and automated procedures for assaying electrolytes, blood gases, carbohydrates, lipids, proteins, and drugs. Emphasis is placed on specimen processing and generation and evaluation of diagnostic data. Lab fee $2. Prerequisite: MDLS 4174. Co-Requisite: MDLS 4276.

**MDLS 4179. Clinical Chemistry II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised learning experiences with emphasis on manual, semi-automated, and automated procedures for assaying metabolites, drugs, enzymes, hormones, and tumor markers. Emphasis is placed on specimen selection, processing, analyses, and evaluation of diagnostic data. Lab fee $2. Prerequisite: MDLS 4177. Co-Requisite: MDLS 4278.

**MDLS 4182. Computer Applications in Science and Medicine. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Use of computers in the scientific and medical fields. Emphasis is placed on using word processing and spread sheets; charting and graphing of data; presentation packages; tools for literature search; information search using the internet; and description and evaluation of current laboratory information systems.

**MDLS 4202. Molecular Diagnostics. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
An overview of molecular mechanisms including replication, transcription, and translation. Emphasis is placed on the principles of molecular methods and their application in diagnosis of microbiologic, immunologic, genetic, endocrine, hematopoietic, and metabolic disease.

**MDLS 4204. Clinical Correlations and Capstone Review Speciality. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course employs an integrative approach to laboratory medicine with emphasis on the review of patient cases and appropriate utilization of laboratory tests in diagnosis and case management. A comprehensive review and assessment of the concepts in a specialty area of medical laboratory medicine.

**MDLS 4224. Hematology I Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Studies on the formation, function, and identification of normal cellular blood elements are discussed. Emphasis is placed on normal physiology and characteristics of blood cells in all ages. Co-Requisite: MDLS 4125 or approval of department head.

**MDLS 4226. Hematology II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Studies on the formation and identification of abnormal cellular blood elements are discussed. Emphasis is placed on abnormal physiology and hematologic manifestations of disease. Prerequisite: MDLS 4224 or approval of department head. Co-Requisite: MDLS 4125 or approval of department head.

**MDLS 4234. Medical Microbiology I Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion of growth characteristics, morphology, physiology, and identification criteria of human pathogenic microorganisms and normal flora. Co-Requisite: MDLS 4135 or approval of department head.

**MDLS 4236. Medical Microbiology II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion of antimicrobial susceptibility, anaerobic bacteria, mycobacteria, chlamydia, rickettsia, and an overview of infections by organ system. Emphasis is on epidemiology, pathogenesis, source of isolation, and conventional and molecular methods of diagnosis of human pathogenic organisms. Prerequisite: MDLS 4234 or approval of department head. Co-Requisite: MDLS 4137 or approval of department head.

**MDLS 4244. Immunohematology I Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion of the principles of immunohematology in relation to blood grouping, typing, compatibility testing, and antibody detection and identification. Co-Requisite: MDLS 4145 or approval of department head.

**MDLS 4246. Immunohematology II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion of the principles of immunohematology in relation to transfusion and transplant medicine, donor processing, and component preparation and storage. Prerequisite: MDLS 4244. Co-Requisite: MDLS 4147.

**MDLS 4276. Clinical Chemistry I Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
An introduction to the theories and principles of diagnostic methods used to measure common analytes involved in water and acid base balance, mineral and metabolic homeostasis in serum and other body fluids. Normal physiology and biochemical manifestation of disease are emphasized. Co-requisite : MDLS 4177.

**MDLS 4278. Clinical Chemistry II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion and comparison of diagnostic methods employed in the clinical chemistry laboratory. Emphasis is placed on diagnostic metabolites, enzymology, endocrinology, and tumor markers. Normal physiology and biochemical manifestations of disease are discussed. Prerequisite: MDLS 4276. Co-Requisite: MDLS 4179.

**MDLS 4360. Introduction to Clinical Immunology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Discussion of immunological mechanisms fundamental to resistance to disease. Emphasis is placed on the basic humoral and cellular immune response and resistance to microbial disease with particular attention to medical laboratory assay principles.

**MDLS 4391. Integrated Clinical Laboratory Practice and Research. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 5-15 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An integrated clinical laboratory course designed to introduce the concepts of specimen tracking and processing using a laboratory information system, test result utilization, utilization review, and clinical research. Emphasis will be placed on workload organization; quality control evaluation accuracy; consistency; validity of results generated; and appropriate reporting of results. Lab fee $2.

**MDLS 4592. Clinical Laboratory Practicum I. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 5-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in hematology, hemostasis, and body fluid analysis. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4593. Clinical Laboratory Practicum II. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 8-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in medical microbiology and parasitology. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4594. Clinical Laboratory Practicum III. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 8-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in immunology, serology, and blood banking. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4595. Clinical Laboratory Practicum IV. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 8-40 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work and solving problems in clinical chemistry, toxicology, and molecular pathology. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 4896. Advanced Clinical Practicum. 1-8 Credit Hours (Lecture: 0 Hours, Lab: 3-24 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in the clinical laboratory. Emphasis is given to high complexity testing. Grading in this course is satisfactory/unsatisfactory.

**MDLS 5086. Clinical Laboratory Science Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Independent research under the supervision of an instructor. A formal report will be submitted to the instructor. A maximum of six hours may be taken.

**MDLS 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin thesis. No credit until thesis is completed.

**MDLS 5090. Special Topics. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Study of selected topic(s) directly related to medical laboratory science. May be repeated once for credit as topic varies.

**MDLS 5091. Integrated Clinical Laboratory Science and Research. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 5 Hours).**
An integrated clinical laboratory course designed to introduce the concepts of specimen tracking and processing using a laboratory information system, test result utilization, utilization review, and clinical research. Emphasis will be placed on workload organization; quality control evaluation accuracy; consistency; validity of results generated; and appropriate reporting of high complexity results.

**MDLS 5092. Clinical Laboratory Practicum I. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 16 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in hematology, hemostasis, and body fluid analysis. Emphasis is placed on the analysis of high complexity quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 5093. Clinical Laboratory Practicum II. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 16 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving high complexity problems in medical microbiology and parasitology. Emphasis is placed on the analysis of quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 5094. Clinical Laboratory Practicum III. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 16 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work, and solving problems in immunology, serology, and blood banking. Emphasis is placed on the analysis of high complexity quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 5095. Clinical Laboratory Practicum IV. 1-5 Credit Hours (Lecture: 0 Hours, Lab: 16 Hours).**
Structured clinical experience directed toward development of laboratory skills, organizing work and solving problems in clinical chemistry, toxicology, and molecular pathology. Emphasis is placed on the analysis of high complexity quality assurance data and application of laboratory information systems and automation. Grading in this course is satisfactory/unsatisfactory.

**MDLS 5099. Practicum, Field Problem, or Internship. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 8-24 Hours).**
Supervised professional activities in specialized laboratory settings. A maximum of six hours may be taken.

**MDLS 5101. CLS Literature review Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Review of current literature topics in the medical laboratory sciences. Emphasis is placed on critique of methods, research design and value to the current body of knowledge. May be repeated for credit for a maximum of 6 credit hours.

**MDLS 5110. Hematology for Cytogeneticist. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Study of the formation and function of the formed elements of the blood. Emphasis is placed on the pathogenesis of peripheral blood and bone marrow disorders including the correlation of cytogenetic abnormalities. Course Fee $30.

**MDLS 5116. Body Fluids Analysis. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Advanced concepts related to the biochemical and cellular analysis of body fluids. Includes normal physiologic function and pathophysiology of synovial, semenal, cerebrospinal, serous, and amniotic fluid. Emphasis on additional analysis and troubleshooting skills.

**MDLS 5127. Hematology II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised experiences with emphasis placed on the enumeration, morphology, and staining characteristics of abnormal blood cells. Emphasis will be placed on specimen processing and generation and evaluation of diagnostic data and additional analysis and troubleshooting skills. Prerequisites: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-requisite MDLS 5226.

**MDLS 5137. Medical Microbiology II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised experience with emphasis on staining, isolation, identification, and antimicrobial susceptibility testing of microorganisms isolated from clinical specimens. Emphasis is also placed on specimen processing and generation and evaluation of diagnostic data and additional analysis and troubleshooting skills. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-requisite MDLS 5236.

**MDLS 5138. Medical Mycology and Virology. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Discussion of the epidemiology and pathogenesis of fungi and viruses implicated in human disease. Emphasis will be placed upon diagnostic tools used in the clinical laboratory to isolate, culture, and identify these microorganisms and additional analysis and troubleshooting skills.

**MDLS 5147. Immunohematology II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 4 Hours).**
Supervised experiences related to antibody detection and identification, incompatibility and transfusion reaction resolution; component processing and storage; and selection for therapy. Emphasis is placed on specimen processing, laboratory techniques, and generation and evaluation of diagnostic data and additional analysis and troubleshooting skills. Prerequisites: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-requisite MDLS 5246.

**MDLS 5166. Immunology and Serology II Lecture. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Discussion of immunologic mechanisms and pathogenesis involved in autoimmune, allergic, and immunodeficient diseases. Emphasis on analysis and troubleshooting.

**MDLS 5167. Immunology and Serology II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
Supervised learning experience with emphasis on the detection, identification, and characterization of antigens and antibodies involved in autoimmune disease. Also emphasis on cells involved in cellular immunity using immunologic techniques. Emphasis is placed on specimen processing and generation and evaluation of diagnostic data and high complexity analysis and troubleshooting skills. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-requisite MDLS 5166.

**MDLS 5170. Clin Cytogenetics Lab Oper/Pra. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course is designed to acquaint students with the operations of a modern cytogenetics laboratory. Emphasis will be placed on problem-solving processes and strategies to resolve difficult cases. Issues related to the reimbursement and regulation are addressed. Course Fee $30.

**MDLS 5174. Intro Lab Safety and Operations. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Introduction to the theories and principles of instrument operation and safety practices commonly used in the clinical laboratory. Supervised learning experience in instrument operation and troubleshooting. Course fee $15.

**MDLS 5179. Clinical Chemistry II Lab. 1 Credit Hour (Lecture: 0 Hours, Lab: 5 Hours).**
Supervised learning experiences with emphasis on manual, semi-automated, and automated procedures for assaying metabolites, drugs, enzymes, hormones, and tumor markers. Emphasis is placed on specimen selection, processing, analyses, and evaluation of diagnostic data and on high complexity analysis and troubleshooting skills. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-requisite MDLS 5278.

**MDLS 5202. Molecular Diagnostics. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
An overview of molecular mechanisms including replication, transcription, and translation. Emphasis is placed on the principles of molecular methods and their application in diagnosis of microbiologic, immunologic, genetic, endocrine, hematopoietic, and metabolic disease.

**MDLS 5204. Clinical Correlations and Capstone Review. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Course employs an integrative approach to laboratory medicine with emphasis on the review of patient cases and appropriate utilization of laboratory tests in diagnosis and case management. A comprehensive review and assessment of the concepts in clinical laboratory medicine.

**MDLS 5206. Laboratory Management. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Designed to acquaint students with the principles of operating a clinical laboratory. Emphasis is on personnel, financial, marketing, and general administrative management. Also, the student is introduced to writing instructional objectives, constructing evaluation instruments, and planning instructional strategies and establishing a professional development program. Ethical issues in laboratory medicine are also discussed.

**MDLS 5220. Medical Genetics. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Study of human genetics including chromosome structure, principles of inheritance, anatomy and physiology of a gene, genetic expression and regulation, cytogenetics, immunogenetics, molecular genetics, with an emphasis on diagnostic testing for human genetic diseases and the genetic basis of cancer. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program.

**MDLS 5221. Immunopathology. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Principles of innate and adaptive immunity including antigen recognition, signal transduction, lymphocyte development and homeostasis of lymphocyte populations, cytokine effects, failure of host defense mechanisms such as autoimmunity, immunodeficiencies, immunoproliferative diseases, analysis of the immune response in intact and manipulated organisms, and tumor immunobiology, with emphasis on clinical induction, measurement and manipulation of the human immune response. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program.

**MDLS 5226. Hematology II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Studies on the formation and identification of abnormal cellular blood elements are discussed. Emphasis is placed on abnormal physiology and hematologic manifestations of disease and high complexity analysis and troubleshooting. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-Requisite Course: MDLS 5125 or approval of department head.

**MDLS 5236. Medical Microbiology II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion of antimicrobial susceptibility, anaerobic bacteria, mycobacteria, chlamydia, rickettsia, and an overview of infections by organ system. Emphasis is on epidemiology, pathogenesis, source of isolation, and conventional and molecular methods of diagnosis of human pathogenic organisms and high complexity analysis and troubleshooting. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-Requisite Course: MDLS 5137 or approval of department head.

**MDLS 5246. Immunohematology II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion of the principles of immunohematology in relation to transfusion and transplant medicine, donor processing, and component preparation and storage and high complexity analysis and troubleshooting. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-Requisite Course: MDLS 5147.

**MDLS 5272. Clinical Laboratory Administration. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Principles and practices of administration of the clinical laboratory. Emphasis is placed on administrative issues unique to the clinical laboratory including coding, billing, reimbursement, government regulation, accreditation and information management processes. Prerequisite: MDLS 5206.

**MDLS 5278. Clinical Chemistry II Lecture. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Discussion and comparison of diagnostic methods employed in the clinical chemistry laboratory. Emphasis is placed on diagnostic metabolites, enzymology, endocrinology, tumor markers and high complexity analysis and troubleshooting. Normal physiology and biochemical manifestations of disease are discussed. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program. Co-Requisite Course: MDLS 5179.

**MDLS 5295. Clinical Cytogenetics Pract I. 2 Credit Hours (Lecture: 0 Hours, Lab: 13 Hours).**
Under the supervision and instruction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to expand their knowledge of principles and techniques involved in the practice of cytogenetics that were introduced in the diadactic portion of the curriculum. the student will gain experience in procedures related to karyotyping with an emphasis on peripheral blood specimens. Clinical correlations of the chromosomal findings are emphasized. Field assignment fee $75. Grading in this course is satisfactory or unsatisfactory.

**MDLS 5296. Clinical Cytogenetics Pract II. 2 Credit Hours (Lecture: 0 Hours, Lab: 13 Hours).**
Under the supervision and instruction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to expand their knowledge of principles and techniques involved in the practice of cytogenetics that were introduced in the diadactic portion of the curriculum. The student will gain experience in procedures related to karyotyping with an emphasis on amniotic fluid, chorionic villi samples,bone marrow and solid tumor specimens. Clinical correlations of the chromosomal findings are emphasized. Field assignment fee $75. Grading in this course is satisfactory or unsatisfactory.

**MDLS 5297. Clinical Cytogenetics Pract III. 2 Credit Hours (Lecture: 0 Hours, Lab: 13 Hours).**
Under the supervision and instruction of a clinical instructor in a hospital or reference laboratory setting, the student will have the opportunity to expand their knowledge of principles and techniques involved in the practice of cytogenetics that were introduced in the diadactic portion of the curriculum. The student will gain experience in procedures related to karotyping, FISH and molecular techniques. Clinical correlations of the chromosomal findings are emphasized. Field assignment fee $75. Grading in this course is satisfactory or unsatisfactory.

**MDLS 5325. Clinical Molecular Microbiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies of the genetics and physiology of microbes, including fundamental processes of gene regulation, genome structure, and protein synthesis and processing. Emphasis is placed on the clinical molecular identification of bacteria, viral, fungal and parasitic organisms including real-time PCR techniques, quality assurance practices, and interpretation of results in a clinical setting.

**MDLS 5330. Medical Biochemistry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A review of the major biochemical processes in the human body, their physiology role and their relationship to human disease. Emphasis will be placed upon emerging diagnostic testing and clinical correlations in the areas of endocrinology, tumor biology, lipoprotine structure and function, diabetes case management, protein structure and function, and toxicology. Prerequisite: Students must be admitted into the Medical Laboratory Sciences Master of Science program.

**MDLS 5331. Molecular and Cellular Pathology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the molecular and cellular aspects of human disease. Emphasis will be placed on microarrays and other emerging diagnostic testing as applied to the regulation of the eukaryotic cell cycle, signal transduction pathways, molecular mechanisms, receptor/membrane function and their relationship to tumor biology, endocrine dysfunction, dyslipidemia and other pathophysiologic conditions. Prerequisites: BIOL 5309 or MDLS 5202.

**MDLS 5340. Clinical and Anatomic Pathology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Clinical and anatomic pathology is focused on the development of pathophysiologic mechanisms underlying human disease. Students are introduced to basic etiologies and pathogenesis that underlie all diseases. More detailed discussions of pathologic mechanisms including structural lesions (morphology) and functional consequences (clinical presentation) will be discussed within specific diseases of organ systems. Applications of the clinical laboratory in disease diagnosis and management will also be included.

**MDLS 5355. Clinical Cytogenetics Techniques I. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
This course introduces all aspects of the modern cytogenetics laboratory including karotyping and probe based assays including fluoresence in-situ hybridization (FISH). Quality assurance aspects of quality laboratory practices are introduced as well as regulatory issues. Course Fee $30 Lab Fee $30.

**MDLS 5356. Clinical Cytogenetics Techniques II. 3 Credit Hours (Lecture: 1 Hour, Lab: 6 Hours).**
This course is a continuation of MLS 5355 and provides more advanced practice in all aspects of the modern cytogenetics laboratory including karotyping and fluoresence in-situ hybridization (FISH). Quality assurance aspects of quality laboratory practices are emphasized as well as regulatory issues. Lab fee $2.

**MDLS 5398. Statistical Methods Health Care Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Practical applications of general principles of descriptive and inferential statistics used in health care research. Skill development in use of statistical software as a tool to analyze health data available from national databases. Emphasis will be placed on the interpretation and communication of research results. Course Fee $50.

**MDLS 5412. Clinical Cytogenetics. 4 Credit Hours (Lecture: 4 Hours, Lab: 0 Hours).**
This covers the history of cytogenetics, mechanisms of structural abnormalities, clinical correlation of autosomal and sex chromosome anomalies, cytogenetic syndromes, inheritance patterns and cancer genetics with a focus on correlation between the diagnosis and treatment of diseases associated with genetic abnormalities. Course Fee $30.

**MDLS 5450. Molecular Diagnostics Techniques I. 4 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
This course provides an introduction to the basic genetic techniques used in a clinical molecular genetics laboratory. Laboratory technique instruction, skill development and practice in isolation of DNA and RNA from clinical samples, preparation of nucleic acid probes, molecular hybridization techniques, amplification techniques and hybridization analysis will be addressed. Emphasis will be placed on laboratory design issues, prevention of product contamination, quality assurance and regulatory issues, safety, and interpretation and application of test results.

**MDLS 5451. Molecular Diagnostics Techniques II. 4 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
This course provides a continuation of the basic genetic techniques covered in Molecular Diagnostics Techniques I, which may be used in a clinical molecular genetics laboratory. Laboratory technique instruction, skill development and practice in real-time PCR, reverse transcriptase PCR, nested PCR and single nucleotide polymorphism (SNP) detection will be emphasized. Emphasis will be placed on laboratory design issues, prevention of product contamination, quality assurance and regulatory issues, safety, and interpretation and application of test results. Prerequisite: MDLS 5450.

# Military Science

## Courses

**MLSC 1201. Introduction to the Army. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The purpose of this course is to introduce Cadets to the personal challenges and competencies that are critical for effective leadership. Cadets learn how the personal development of life skills such as critical thinking, time management, goal setting, stress management, and comprehensive fitness relate to leadership, and the Army profession.

**MLSC 1202. Foundations of Agile and Adaptive Leadership. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course expands upon the fundamentals introduced in the previous course by focusing on communications, leadership, and problem solving. 'Life skills' lessons include: problem solving, goal setting, and interpersonal communication skills. The course also provides current information about life in the Army, the organizations of the Army, employment benefits, and work experiences expected of junior officers.

**MLSC 2301. Leadership and Decision Making. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The first semester of the MS II year is designed to develop cadet's knowledge of self, self-confidence, and individual leadership skills. Through experiential learning activities, cadets develop problem solving and critical thinking skills, and apply communication, feedback and conflict resolution skills.

**MLSC 2302. Army Doctrine and Team Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The second semester of the MS II year focuses on self development, guided by knowledge of self and group processes. Experiential learning activities are designed to challenge cadets' current beliefs, knowledge and skills. This course also prepares enrolled students for the ROTC Advanced Course, as well as the summer Leaders Training Course.

**MLSC 3301. Training Management and the Warfighting Functions. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course is designed to enable a student with no prior military or cadet experience to quickly learn essential cadet knowledge and skills. The course introduces the principles of physical fitness, healthy lifestyles and the Leader Development Program that will be used to evaluate leadership performance and provides cadets with developmental feedback, used throughout the year. Cadets learn how to plan and conduct individual and small unit training, as well as basic tactical principles. The course conducts a four-week study of reasoning skills and the military-specified application of these skills in the form of the Army's troop leading procedures. The final four weeks examines officership. This course serves as the first and primary course of the ROTC Advanced Courses. Prerequisites: Student must have MLSC 1201, 1202, 2301, and 2302. Students must also have approval from the Professor of Military Science to take this class. Basic Training or Cadet Initial Entry Training may be used as a substitute for the MLSC prerequisite courses.

**MLSC 3302. Applied Leadership in Small Unit Operations. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course is designed to continue the development of cadets as leaders by presenting instructions in the areas of leadership, interpersonal communications, values and ethics. The leadership module expands on key leadership concepts and provides feedback for cadet leadership self-development efforts. Interpersonal communications lessons address general communication theory as well as written and spoken communication skills. The highlight of the communication module is the opportunity for cadets to present an information briefing and receive feedback from both instructor and fellow students. Prerequisites: Student must have MLSC 1201, 1202, 2301, and 2302. Students must also have approval from the Professor of Military Science to take this class. Basic Training or Cadet Initial Entry Training may be used as a substitute for the MLSC prerequisite courses.

**MLSC 3304. Basic Army Leadership Course. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
Application and integration of academic study and development of skills in a field setting. The Course incorporates a wide range of training events designed to develop/assess leadership and officer potential to qualify Cadets for contracting.

**MLSC 4086. Independent Study. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
A course open to Military Science students. Topics vary according to student need. May be repeated for a maximum of 6 hours. Open to students of junior or senior classification. Prerequisite: Approval of the department head.

**MLSC 4301. The Army Officer. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
This course concentrates on Army operations and training management, communications and leadership skills and supports the beginning of the final transition from cadet to lieutenant. The course enables cadets to attain knowledge and proficiency in several critical areas needed to operate effectively as an Army officer. These subjects have the added benefit of preparing cadets to lead the cadet battalion throughout the remainder of the year. At the end of this semester, cadets possess the fundamental skills, attributes, and abilities required to operate as competent leaders in the cadet battalion. Prerequisites: Student must have MLSC 1201, 1202, 2301, and 2302. Students must also have approval from the Professor of Military Science to take this class. Basic Training or Cadet Initial Entry Training may be used as a substitute for the MLSC prerequisite courses.

**MLSC 4302. Company Grade Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The final semester course of the MS IV year trains cadets on Military Law, task organizations, maintenance, supply management, and physical training. Cadets conduct a Capstone Practical Exercise, assuming leadership roles as a lieutenant entering a new unit. The course is designed to prepare transition and groom senior cadets to become Army Officers. Prerequisites: Student must have MLSC 1201, 1202, 2301, and 2302. Students must also have approval from the Professor of Military Science to take this class. Basic Training or Cadet Initial Entry Training may be used as a substitute for the MLSC prerequisite courses.

# Music-Applied

## Courses

**MUAP 1103. Voice Class. 1 Credit Hour (Lecture: 3 Hours, Lab: 1.5 Hour).**
Assists students in the basic elements and techniques of vocal production for singing.

**MUAP 1121. Applied Music for Music Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 1122. Applied Music for Music Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 1231. Applied Music Concentration. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 1232. Applied Music Concentration. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 2121. Applied Music for Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 2122. Applied Music for Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 2231. Applied Music for Majors. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 2232. Applied Music for Majors. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 3121. Applied Music for Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 3122. Applied Music for Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 3231. Applied Music for Majors. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 3232. Applied Music for Majors. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 3331. Applied Music for Majors - Performance. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Upper level applied Lessons designed specifically for music majors in the Bachelor of Music - Performance Degree. Lab fee: $2.

**MUAP 3332. Applied Music for Majors - Performance. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Upper level applied Lessons designed specifically for music majors in the Bachelor of Music - Performance Degree. Lab fee: $2.

**MUAP 4121. Applied Lessons for Music Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 4122. Applied Music for Minors or Non-Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Lab fee $15.

**MUAP 4231. Applied Music for Majors. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 4232. Applied Lessons for Majors. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Lab fee $30.

**MUAP 4331. Applied Music for Majors - Performance. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Upper level applied Lessons designed specifically for music majors in the Bachelor of Music - Performance Degree. Lab fee: $2.

**MUAP 4332. Applied Music for Majors - Performance. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Upper level applied Lessons designed specifically for music majors in the Bachelor of Music - Performance Degree. Lab fee: $2.

**MUAP 5121. Applied Minor Lessons for Graduate Majors. 1 Credit Hour (Lecture: .5 Hours, Lab: 1.5 Hour).**
Applied minor lesson instruction in instrument or voice on the graduate level. Prerequisite: No Lab fee: $2.

**MUAP 5231. Applied Lessons for Graduate Majors. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
Applied instruction in instrument or voice on the graduate level. Prerequisite: Admission in the graduate program. Lab fee: $2.

# Music Ensemble

## Courses

**MUEN 1121. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
PLEASE ENTER COURSE DESCRIPTION.

**MUEN 1122. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
PLEASE ENTER COURSE DESCRIPTION.

**MUEN 2121. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**

**MUEN 2122. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**

**MUEN 3121. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
n/a.

**MUEN 3122. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
n/a.

**MUEN 4121. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**

**MUEN 4122. Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**

**MUEN 5121. Graduate Music Ensemble. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
Graduate Music Ensemble Prerequisite: Admission to the graduate program.

# Music

## Courses

**MUSI 1000. Recital Attendance. 0 Credit Hours (Lecture: 0 Hours, Lab: 0 Hours).**

**MUSI 1100. Transitioning to University Studies in Music. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. These skill sets are presented in the context of music disciplines.

**MUSI 1101. Marching Band. 1 Credit Hour (Lecture: 1 Hour, Lab: 4 Hours).**
Marching Band membership is open to all students of the University with approval of the director. Activities include half-time performances, pep rallies, parades, and other concerts. Prerequisites: Prior marching band experience in high school or junior college or approval of department head. Credits may substitute for required P ED and may be repeated.

**MUSI 1116. Aural Skills I. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Singing tonal music in treble, bass, alto, and tenor clefs. Aural study, including dictation, of rhythm, melody, and diatonic harmony. Lab fee: $15.

**MUSI 1117. Aural Skills II. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Continued development of singing tonal music in treble, bass, alto, and tenor clefs. Continued aural study, including dictation, of rhythm, melody, and diatonic harmony. Prerequisite: MUSC 1116. Lab fee: $15.

**MUSI 1160. Italian Diction. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Italian pronunciation for singers. Lab fee $10.

**MUSI 1166. Woodwind Class I. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Instruction on basic woodwind instruments for music majors; maintenance of instruments; evaluation of materials and literature. Students develop a basic technique on two instruments. Lab fee $15.

**MUSI 1167. Woodwind Class II. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Instruction on basic woodwind instruments for music majors; maintenance of instruments; evaluation of materials and literature. Students develop a basic technique on two instruments. Lab fee $15.

**MUSI 1178. Brass Class I. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Performance instruction on basic brass instruments for music majors; maintenance of instruments; evaluation of materials and literature. Students develop a basic technique on two instruments. Lab fee $15.

**MUSI 1179. Brass Class II. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Continued instruction on basic brass instruments for music majors; maintenance of instruments; evaluation of materials and literature. Students develop a basic technique on at least one low brass instrument. Lab fee $15.

**MUSI 1181. Piano Class I. 1 Credit Hour (Lecture: 3 Hours, Lab: 1.5 Hour).**
Beginning piano class designed to develop keyboard and musicianship skills, including fundamental technique, scale playing, sight reading, harmonization of melodies, and accompaniment. The course is intended for music majors in passing the Piano Proficiency Examination. All other majors and undeclared majors must have the permission of the course instructor to register. Lab fee: $2.

**MUSI 1182. Piano Class II. 1 Credit Hour (Lecture: 3 Hours, Lab: 1.5 Hour).**
A continuation of Piano I, designed to develop keyboard and musicianship skills, including fundamental technique, scale playing, sight reading, harmonization of melodies, and accompaniment. The course is intended for music majors in passing the Piano Proficiency Examination. All other majors and undeclared majors must have the permission of the course instructor to register. Prerequisite: MUSI 1181 Lab fee: $2.

**MUSI 1188. Percussion Class I. 1 Credit Hour (Lecture: 1 Hour, Lab: 2 Hours).**
Fundamental performance techniques on the most frequently used percussion instruments, both of definite and indefinite pitch; conventions of notation, instrument maintenance, evaluation of materials, and literature. For music majors. Lab fee $10.

**MUSI 1195. Strings Class I. 1 Credit Hour (Lecture: 1 Hour, Lab: 2 Hours).**
Beginning string class for music majors; maintenance of instruments, evaluation of materials and literature. Students develop a basic performance technique on two instruments. Lab fee $10.

**MUSI 1262. Diction I. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Instruction in the International Phonetic Alphabet (IPA) and its symbols used in English, German, French, and Italian vocal repertoire. Application of correct diction to German vocal literature.

**MUSI 1303. Fundamentals Of Music. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to the basic elements of music theory, including scales, intervals, keys, triads, elementary ear training, notation, meter, and rhythm. Course does not apply to a music major degree.

**MUSI 1306. Music Appreciation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides opportunities to become familiar with the basic elements of music. Emphasis is on learning to listen to music and on the role it plays within the wider contexts of history and society. Listening materials are drawn from a variety of sources: classical music, non-Western music, American popular music (particularly jazz, country, and rock), and the American folk tradition. Course fee $10.

**MUSI 1310. Popular Music in America. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory study of popular music in the U.S., emphasizing the development and application of analytical skills oriented toward the popular arts. Concert attendance and/or listening requirements.

**MUSI 1311. Music Theory I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to music fundamentals, staff, clefs, key signatures, scales, time signatures and notation; meter and rhythm; chords and harmony; and melodic organization and structure.

**MUSI 1312. Music Theory II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of diatonic harmony, elementary counterpoint, and part writing; harmonization of melodies in eighteenth-century style. Prerequisite: MUSC 1311.

**MUSI 1320. Introduction to Audio Technology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Provides an introduction to the use of audio technology in making analog and digital recordings with an emphasis on musical instruments and applications, as well as live audio productions and videos to audio. Students will gain experience with studio facilities and equipment, digital audio, modern microphone technique, and modern recording processes in a variety of sound situations when applicable to recording musical instruments and performances. Lab fee: $15.

**MUSI 1330. Introduction to Music Business. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A survey of the various facets of the current and evolving music industry, highlighting areas where music and business intersect. Topics include an overview of key principles, terms, and practices; basic principles of marketing and promoting music; and careers in the commercial music industry. Lab fee: $15.

**MUSI 2116. Aural Skills III. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Singing more difficult tonal music, including melodies with any diatonic leap possible and a wider variety of rhythms. Aural study, including dictation of more complex rhythm and melody. Prerequisites: MUSI 1116 and MUSI 1117. Lab fee: $15.

**MUSI 2117. Aural Skills IV. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Singing more difficult tonal music, including chromatic, modulating and melodies; and modal melodies. Continued aural study, including dictation of more complex rhythm and melodies. Prerequisites: MUSC 1116, 1117, 2116. Lab fee: $15.

**MUSI 2160. German Diction. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
German pronunciation for singers. Lab fee $10.

**MUSI 2161. French Diction. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
French pronunciation for singers. Lab fee $10.

**MUSI 2181. Piano Class III. 1 Credit Hour (Lecture: 3 Hours, Lab: 1.5 Hour).**
Section III of the piano class sequence designed to develop keyboard and musicianship skills, including fundamental technique, scale playing, sight reading, harmonization of melodies, and accompaniment. The course is intended for music majors in passing the Piano Proficiency Examination. It is an elective for those students needing additional instruction in order to pass the proficiency. All other majors and undeclared majors must have the permission of the course instructor to register. Prerequisites: MUSI 1181 and MUSI 1182 Lab fee: $2.

**MUSI 2182. Piano Class IV. 1 Credit Hour (Lecture: 3 Hours, Lab: 0 Hours).**
This is the fourth semester of a four-semester sequence designed to develop keyboard and musicianship skills, including fundamental technique, scale playing, sight reading, harmonization of melodies, and accompaniment. The course is intended for music majors in passing the Piano Proficiency Examination. All other majors and undeclared majors must have the permission of the course instructor to register. Lab fee $10.

**MUSI 2262. Diction II. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Continuation of studies in diction applied to vocal literature, focusing on French and Italian languages. Prerequisite: MUSI 1262.

**MUSI 2311. Music Theory III. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Continuation of the study of diatonic harmony and counterpoint; elementary modulation, an introduction to chromatic harmony, modal harmony, and extended harmony. Prerequisites: MUSC 1311 and MUSC 1312.

**MUSI 2312. Music Theory IV. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of chromatic harmony in tonal music of the late 19th century and an introduction to 20th century post-tonal practices. Prerequisites: MUSI 1311, 1312, and 2311.

**MUSI 2360. Jazz Harmony. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of jazz harmony and structure, including chord and scale construction and nomenclature. Emphasis will be be placed on the spelling, naming, and aural recognition of jazz chords, scales, and basic harmonic structures. Prerequisite: MUSI 1312.

**MUSI 3000. Junior Recital. 0 Credit Hours (Lecture: 0 Hours, Lab: 0 Hours).**

**MUSI 3100. Marching Band. 1 Credit Hour (Lecture: 1 Hour, Lab: 4 Hours).**
Marching Band membership is open to all students of the University with approval of the director. Activities include half-time performances, pep rallies, parades, and other concerts. Prerequisites: Prior marching band experience in high school or junior college or approval of department head. Course may be repeated for credit. Lab fee $10.

**MUSI 3116. Performance Practices of Ensembles. 1 Credit Hour (Lecture: 1 Hour, Lab: 2 Hours).**
Organization, rehearsal procedures, and public performance practices of ensembles. Establishing a philosophy of music, developing effective ensemble discipline, motivation, selection of repertoire, auditions, and the professional development of the music director are emphasized.

**MUSI 3201. Digital Music and Beat Production. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
This course explores the tools and techniques needed to produce music through desktop music production. Lab fee: $2.

**MUSI 3202. Artist and Self Management. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
This course provides an overview of the practices and requirements needed to develop, maintain, and manage an artist's/self career in today music industry. Topics include basic management principles, promotion strategies, current revenue streams, and coaching/leading artists to their career goals. Lab fee: $2.

**MUSI 3211. Conducting I. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
Introduction of conducting techniques, rehearsal procedures, development of interpretive skills in music. Lab fee $5.

**MUSI 3212. Conducting II. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
Special emphasis on instrumental and choral conducting techniques. Lab fee $5. Prerequisite Course: MUSI 3211.

**MUSI 3226. History of Music I. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Study of history, social setting, and style of Western art music from Greek antiquity to the end of the Renaissance period. MUSI 2311 or approval of department head.

**MUSI 3229. World Music. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Historical and analytical survey of the great variety of musical styles from around the world. Music cultures of sub-Saharan Africa, India, indigenous America, and Japan are among those explored. Emphasizes the complex interrelationships of music to culture, society, and daily life. Prerequisite: MUSI 2312 or approval of the department head.

**MUSI 3245. Class Composition. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
Advanced instruction in composition; the writing and study of small- and larger-form musical compositions employing contemporary styles and techniques. May be taken 2 times for credit. Prerequisites: approval of instructor. Lab fee $5.

**MUSI 3249. Contemporary Music Theory. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
The study of techniques of musical analysis as applied to different forms of music. Discussion will address (but not limited to) forms found in the Baroque, Classical, Romantic, Post-Romantic, and Contemporary eras using a variety of analysis techniques. Prerequisites: MUSI 1311, 1312, 2311, and 2312.

**MUSI 3300. Music Publishing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the creative and administrative aspects of music publishing including, but not limited to, contracts, music licensing, copyright law, and role of performance rights organizations.

**MUSI 3315. Developmental Musical Experiences. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study and appraisal of music teaching techniques, elementary music literature, learning activities, curricular plans and materials essential to the sequential development of musical learning in the elementary school. Designed to provide knowledge of psychology, theory and practice of music education in the elementary schools. Emphasis is placed upon the nature, organization and maintenance of the elementary music program. Prerequisite: junior or senior-level status.

**MUSI 3325. Jazz History. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in-depth study of the recordings, history, major figures, musical forms and social importance of an original American art form. Principal styles to be covered include ragtime, blues, Dixieland, big band swing, bop, cool, hard bop, free, fusion and funk. This course fulfills the core visual and performing arts requirement.

**MUSI 3327. History of Music II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Study of the history, social setting and style of Western art music in the Baroque and Classical periods. Prerequisite: MUSI 3226 or approval of department head.

**MUSI 3328. History of Music III. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Study of the history, social setting and style of Western art music during the Romantic and 20th century periods. Prerequisite: MUSI 3327 or approval of department head.

**MUSI 3330. Pro Tools I. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
Introductory course to Pro Tools, the industry standard software for digital recording and editing. This is the most widely used application for post-production, video editing, and mixing for film, video, and multi-media. Prerequisite: MUSI 1320 Lab fee: $2.

**MUSI 3331. Pro Tools II. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
Continuation of Pro Tools I, the industry standard software for digital recording and editing. Development of additional skills in post-production, video editing, and mixing for film, video, and multi-media. Prerequisite: MUSI 3330 Lab fee: $2.

**MUSI 3335. Choral Techniques. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Choral techniques, materials and rationale for the development of superior choral ensembles to include: budgeting, acoustical considerations, music selection criteria, historical development of choral music and style, programming, public relations, sight reading, and development of a philosophy of music.

**MUSI 3360. Jazz Improvisation I. 3 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
Offers the jazz-oriented student an organized approach to learning how to improvise in the jazz idiom as expressed by musical performance. Prerequisite: MUSC 2360.

**MUSI 3361. Jazz Improvisation II. 3 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
Offers the jazz-oriented student an organized approach to learning how to improvise in the jazz idiom as expressed by musical performance. This course is a continuation of MUSI 3260 Jazz Improvisation I Prerequisite: MUSI 3360.

**MUSI 4000. Marching Band. 0 Credit Hours (Lecture: 0 Hours, Lab: 0 Hours).**

**MUSI 4086. Music Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
A directed study of selected problems in music.

**MUSI 4133. Capstone Course in Music. 1 Credit Hour (Lecture: 1 Hour, Lab: 12 Hours).**
The capstone experience is the culmination of undergraduate music study and provides students with an opportunity to make their personal statement of preparedness for a post-college life with music. Projects may include a 50-minute solo recital, a lecture-recital, or an undergraduate thesis or research paper. In conjunction with the student's advisor, study abroad and other formats may be acceptable. Prerequisites: Senior standing. Music majors seeking education certification must take this course before the semester in which they are student teaching. Lab fee $10.

**MUSI 4211. Piano Literature. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course will encompass the study of piano literature from the Renaissance period to present day with emphasis given to the Classical, Romantic, and Contemporary eras. Genres include sonata, suite, concerto, and chamber works with piano of varying cultures.

**MUSI 4212. Vocal Literature. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course will encompass the study of solo vocal literature from the Renaissance period to present day. Emphasis will be given to the development of German and French art song in Europe.

**MUSI 4213. Instrumental Literature. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course will encompass the study of literature for band, jazz ensemble and orchestra, as well as solos and small ensemble groups. Students will explore and analyze significant composers and their literature in each of the historical periods through the 21st century. Prerequisite: Junior level in applied instrumental lessons or consent of the instructor.

**MUSI 4242. Band Techniques. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
Introduction and materials of band techniques to include drill design and the development of the marching ensemble; the organization, administration, programming, repertoire, band literature, budgeting, and historical development of the modern concert wind ensemble; the development of a functional philosophy of music.

**MUSI 4248. Scoring and Arranging for Ensembles. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
A practical study of the skill of scoring music for various instrumental and choral groups. Projects in adapting music from a variety of sources. Emphasis is placed on transcribing and arranging for elementary, junior, and senior high ensembles. Prerequisites: MUSI 2312 or consent of instructor and permission of department head.

**MUSI 4251. Piano Pedagogy. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course will encompass the study of piano pedagogy from beginner level through intermediate and advanced level piano study, including present and past techniques of piano instruction. Prerequisites: Must be at the junior level of applied piano lessons or have consent of the instructor.

**MUSI 4252. Vocal Pedagogy. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
Teaching voice majors how to teach singing. Includes physiology of the vocal mechanism and the application of various techniques appropriate in developing and correcting issues with the voice. Appropriate repertoire for varying levels and voice types will be covered as well as basic business aspects of private studio teaching. Prerequisite: Junior or Senior level music majors in applied voice who have passed the Applied Proficiency Exam. Lab fee $5.

**MUSI 4253. Instrumental Pedagogy. 2 Credit Hours (Lecture: 2 Hours, Lab: 1 Hour).**
This course will focus on the study of instrumental pedagogy, from beginner level through advanced study, used primarily in one-on-one instruction in the studio. Lab fee $10.

**MUSI 4301. Music Business Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An approved and supervised educational project in which the qualifying student participates in a professional music organization as an intern for a select period of time. This course is intended as the capstone experience for the Bachelor of Arts in music degree with an emphasis in music business. Prerequisites: Senior standing, the completion of required music courses and other courses in the Music Business emphasis, and the approval of intern coordinator.

**MUSI 4342. Band Techniques. 3 Credit Hours (Lecture: 0 Hours, Lab: 0 Hours).**
Introduction and materials of band techniques to include drill design and the development of the marching ensemble; the organization, administration, programming, repertoire, band literature, budgeting, and historical development of the modern concert wind ensemble; the development of a functional philosophy of music.

**MUSI 4343. Marching Band Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Marching Band Methods teaches music education majors how to administer a marching band program. Areas of administration are: show design, scheduling, programming, competition. Students will use software to learn to design marching band shows, and review other software useful in administering a marching band program.

**MUSI 4345. Curriculum Project. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The final project for students in the Master of Music Education degree that will serve as a culminating example of work performed at the master's level.

**MUSI 4385. Music Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Content varies according to the needs of students and opportunities available. When topic varies, course may be repeated for credit. Prerequisite: Junior classification or approval of department head.

**MUSI 5086. Graduate Music Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
A directed study of selected problems in the graduate study of music.

**MUSI 5330. Analytical Techniques. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In-depth analysis of common-practice repertoire through multiple techniques. Prerequisite: Admission to the graduate program.

**MUSI 5331. Advanced Scoring and Arranging. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study of scoring music for various instrumental and choral groups. Projects in adapting music from a variety of sources. An emphasis on independent needs are also addressed as they relate to the working music educator. Prerequisite: Admission to the graduate program.

**MUSI 5340. Foundations of Music Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An investigation of historical and philosophical principles that provide the context for contemporary music education. The course focuses on developing a vision of music education for the future. Topics include philosophical principles of music education, psychological theories relevant to music teaching, and practical application of these principles through the National Standards for Music. Prerequisites: Admission to the graduate program.

**MUSI 5341. Research in Music Education I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An exploration of methods and materials of research in music, including styles of writing and proper documentation of sources with an emphasis on developing strategies for organization and information access. Prerequisite: Admission to the College of Graduate Studies.

**MUSI 5342. Research in Music Education II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Overview of music education research. Research design and methodology to include an introduction to the component parts of research and the different types of research. Prerequisite: Admission to the College of Graduate Studies.

**MUSI 5343. Advanced Elementary Music Pedagogy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A graduate course exploring multiple pedagogies in elementary music. Prerequisite: Admission to the graduate program.

**MUSI 5344. Advanced Secondary Music Pedagogy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A comprehensive overview of current methods and materials used in teaching music at the secondary level, grades 7-12. Prerequisite: Admission to the graduate program.

**MUSI 5345. Curriculum Project. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The final project for students in the Master of Music Education degree that will serve as a culminating example of work performed at the master's level. Prerequisite: Successful completion of all coursework required for the Master of Music in Music Education and/or permission from the instructor is required.

**MUSI 5346. Marching Band Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Marching Band Methods teaches music education majors how to administer a marching band program. Areas of administration are: show design, scheduling, programming, competition. Students will use software to learn to design marching band shows, and review other software useful in administering a marching band program. Prerequisite: Admission to the graduate program.

**MUSI 5350. Technology in the Music Classroom. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Development of concepts and skills related to current computer technology in music. Applications of technology in the music classroom will aid in students' acquisition of musical knowledge and skills, and will assist with time-management and organization for the music educator. Prerequisite: Admission to the College of Graduate Studies.

**MUSI 5351. Music Theory Pedagogy for the K-12 Educator. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to develop and implement strategies to incorporate music theory pedagogy in the classroom for the K-12 educator. Students will also develop a comprehensive music theory program for K-12. In addition, AP Music Theory teaching strategies will be addressed.

**MUSI 5353. Ethnomusicology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of the formation of the discipline of ethnomusicology through a survey of its history, theories, and methodologies. Includes basic ethnomusicological concepts, such as organology, music ritual, notation and transcription, and aspects of field research. Research and writing of papers on selected topics.

**MUSI 5354. Topics in Musicology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of selected topics within musicology with a focus on areas relevant to music educators. Course may be repeated for credit as the topic changes, for a maximum of six hours.

**MUSI 5355. Psychology of Music. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A critical examination of questions, designs, and conclusions of previous research in a variety of areas related to the acoustical and psychological aspects of music and how these areas relate to music education. Prerequisite: Admission to the graduate program.

**MUSI 5357. Seminar in Music of the United States. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Music of the United States from the colonists to the present. Selected and significant works will be studied through analysis and performance practice, and in historical context. The diversity of sources and styles include European, African American, Native American, and Spanish-Mexican.

**MUSI 5360. Measurement for Music Researchers. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An exploration of statistics, measurement and evaluation in music education, and the methods and materials of research in music, organize and interpret data, and apply results of published research in music. A variety of research methodology is studied and utilized. It is recommended that students complete MUSI 5341 – Research in Music Education I and MUSI 5342 – Research in Music Education II prior to enrolling into this course.

**MUSI 5361. Acoustics of Music. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the physiological properties of sound, the ear and its perception of sounds; the effect of acoustical environment; the acoustical behavior of musical instruments; and the various applications of electronics and computers to the production, reproduction, and composition of music.

**MUSI 5388. Thesis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin thesis. No credit until thesis is completed. Prerequisites: Successful completion of all coursework required for the Master of Music in Music Education and/or permission from the instructor is required.

**MUSI 5390. Selected Tpcs in Musc Educ. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different topics with a focus on contemporary issues in Music Education. This course may be repeated for credit as the topic changes, for a maximum of six hours. Prerequisite: Approval of Department Head.

**MUSI 5391. Music Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study of the knowledge and skills required to administer an elementary, middle, or high school music program.

# Neuroscience

## Courses

**NRSC 2345. Biological Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory course in the biological and neuroscientific basis of behavior with emphasis on how the brain influences behavior. The basic chemical, electrical, and functional components of the nervous system that influence behaviors, cognition, and emotion will be examined. Prerequisite: PSYC 2301.

**NRSC 3332. Neuropsychopharmacology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the neuroscientific basis of the effects of drugs on behavior. Emphasis will be placed on major antipsychotic, antianxiety, and antidepressant drugs and their clinical use and side effects. Drug abuse such as alcohol, marijuana, and cocaine will also be reviewed. Prerequisite: PSYC 2301 AND 8 hours of lab science.

**NRSC 4303. Animal Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the major areas of animal behavior research from a psychological perspective. Research examining the development and display of behaviors will include subject samples ranging from insects to humans conducted in natural, quasi-experimental, and experimental studies. Prerequisite: PSYC 2301 AND 8 hours of lab science.

**NRSC 4312. Behavioral Neuroscience. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Surveys the biological basis of behavior. Includes an in-depth examination of the physical structure of the human body and the role of chemical and electrical operations within it and how it influences psychological functioning. Emphasis will be placed on the developmental, cognitive, affective and behavioral effects of such operations. Recent research will also be reviewed. Prerequisite: PSYC 2301, 8 hours of lab science (preferably BIOL).

# Nursing

## Courses

**NURS 1100. Transitioning to University Studies in Nursing. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from a Department of Nursing perspective.

**NURS 2150. Communication and Professional Nursing. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Introduces the pre-nursing student to the concepts and processes of communication, the language of nursing, and the interpersonal skills required for working with people. Personal evolution, beginning professional evolution and evolution of nursing as a profession are described. Prerequisites: Completion of 53 hours of general education courses including ENGL1301, ENGL 1302, BIOL 2401, BIOL 2402, BIOL 2420, and CHEM 1407 or 1411. Acceptance to take prenursing courses and concurrent enrollment in NURS 2355 and 2360.

**NURS 2260. Nursing Pathophysiology. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course focuses on the pathophysiologic alterations, interactions, and effects of selected diseases across the life span taking into consideration genetic, ethnic, and cultural variables. Concepts of health promotion, disease prevention, disease progression, and treatment are approached from a cellular and multi-system perspective. Content aims at stimulating critical thinking for application to nursing practice. Prerequisite: Pre- or co-requisite NURS 2355.

**NURS 2265. Nursing Pharmacology I. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course introduces current concepts of pharmacology and their relationship to nursing practice. Ethical/legal and cultural considerations are explored. Prerequisite: NURS 2355.

**NURS 2355. Nursing Foundational Concepts and Competencies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Emphasizes core concepts and competencies of patient centered care across the lifespan. Various professional standards of behavior, attitude, and values related to the theories and concepts of nursing will be examined. Socioeconomic, political, and cultural aspects of healthcare delivery and patient centered care will be discussed. Prerequisites: Completion of 53 hours of general education courses including ENGL 1301, ENGL 1302, BIOL 2401, BIOL 2402, BIOL 2420, and CHEM 1407 or 1411. Acceptance to take prenursing courses and concurrent enrollment in NURS 2360 and 2150.

**NURS 2360. Nursing Pathophysiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on concepts of pathophysiology of common disease processes across the lifespan with considerations to genetic, ethnic, cultural, and environmental variables. Relates the nursing role in the care of individuals experiencing pathophysiologic processes. Prerequisites: Completion of 53 hours of general education courses including ENGL1301, ENGL1302, BIOL2401, BIOL2402, Biol2420, and CHEM1407 or 1411. Acceptance to take prenursing courses and concurrent enrollment in NURS2360 and 2150.

**NURS 3180. Nursing Synthesis II. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
This course is the synthesis of the content taught in Level II courses: Maternal and Child Health Nursing, Lifespan Health Care Delivery II, and Family and Community-Based Nursing. This course continues reinforcing the concepts of patient centered care, safety, procedures, infection control, and assessment with the addition of the management of electronic health records (EHR) and increasingly complex disease processes in a simulated clinical setting. Prerequisites: Admission to the nursing program and successful completion of Level I courses.

**NURS 3210. Nursing Pharmacology II. 2 Credit Hours (Lecture: 1 Hour, Lab: 2 Hours).**
The course provides the student with the opportunity to study the pathophysiological processes in relation to pharmacotherapy. Emphasis is on principles of safe administration of medications and patient education for major drug classifications. Prerequisites: Admission to the Nursing Program and NURS 2265. Lab fee: $2.

**NURS 3270. Nursing Synthesis I. 2 Credit Hours (Lecture: 1 Hour, Lab: 3 Hours).**
This course is the synthesis of the content taught in Level I courses: Pharmacology in Nursing, Health Assessment Across the Lifespan, and Lifespan Healthcare Delivery I. Basic techniques in patient centered care, safety, procedures, infection control, and assessment are taught in a simulated clinical setting. Prerequisite: Admission to nursing program.

**NURS 3300. Pharmacology in Nursing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
This course introduces current concepts of pharmacology and their relationship to nursing practice. Basic principles of mechanism of drug actions, side effects for major drug classifications through discussions utilizing drug prototypes and the role of the nurse in drug therapeutics are discussed. Prerequisite: Admission to the nursing program.

**NURS 3302. Maternal and Child Health Nursing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
This course provides instructional and clinical learning experiences in providing culturally sensitive care to the childbearing family during ante-partum, intra-partum and postpartum periods in a variety of settings. Care of the newborn through the first year of life is addressed. Health issues relating to growth and development are explored. Prerequisites: Admission to the nursing program and successful completion of Level I courses. Lab fee: $2.

**NURS 3303. Behavioral Health Nursing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Emphasizes behavioral health principles in nursing care of mentally and emotionally disabled patients and their families. Knowledge of specific psychopharmacological agents is applied to treatment outcomes. Clinical practicum provides opportunities to examine common psychopathologies, developmental disorders, and community mental health phenomena in a variety of settings. Prerequisites: Admission to the nursing program and successful completion of Level I courses.

**NURS 3305. Professional Role Transitions for RNs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course facilitates socialization as a BSN prepared nurse. Professional standards, attitudes and values central to the profession of nursing are explored. Responsibility and accountability for role transition, professional growth and practice are addressed. Prerequisite: Admission to the nursing program.

**NURS 3307. Health Assess for Lic Nurses. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Fosters acquisition of skills and techniques used in comprehensive health assessment across the lifespan. Explores history taking and the physical examination with consideration given to developmental and ethnocultural variations. Clinical laboratory builds on prior client experiences and known norms; common deviations in health status are identified. This course is offered exclusively to licensed nurses. Pre- or corequisite: NURS 3305. Lab fee $2.

**NURS 3314. Perioperative Nursing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Allows students to expand their understanding and skill in providing care to patients during all phases of the perioperative period. Clinical experiences include outpatient surgery and diagnostic procedure areas of hospitals as well as traditional surgical areas. Prerequisite: Completion of the Sophomore II Nursing semester. Lab fee: $2.

**NURS 3317. Pathophysiology and Pharmacology for Licensed Nurses. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the pathophysiologic alterations, interactions, and effects of selected diseases across the life span taking into consideration genetic, ethnic, and cultural variables. Content aims at stimulating critical thinking for application to nursing practice. This course also introduces current concepts of pharmacology and their relationship to nursing practice. Prerequisite: Admission to the nursing program, and NURS 3305 as either a pre or co-requisite.

**NURS 3318. Nursing Research: Scholarly Inquiry and Evidenced Based Practice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Initially focuses on an introduction to nursing informatics and the use of databases for research to support evidence based nursing practice. The course then moves to an applied understanding of evidence based practice as it relates to the science of nursing with emphasis on appraisal, critique and dissemination of nursing research. Prerequisite: NURS 3305.

**NURS 3322. Health Assessment. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Fosters the acquisition of skills and techniques used in comprehensive health assessment of clients from infancy to older adult. Clinical/laboratory experiences focus on norms in well clients while identifying common deviations in health status of clients of all ages. Prerequisite: Admission to the nursing program.

**NURS 3333. Communication and Professional Nursing for LVNs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course facilitates socialization as a BSN prepared nurse. Professional standards, attitudes and values central to the profession of nursing are explored. Responsibility and accountability for role transition, professional growth, and practice are addressed. Prerequisite: Admission to the nursing program.

**NURS 3342. Health Assessment and Clinical Skills for RNs. 3 Credit Hours (Lecture: 2.5 Hours, Lab: 1.5 Hour).**
The course fosters expansion of skills and techniques used in comprehensive health assessment of clients from infancy to older adult. Experiential learning focuses on norms in well clients while identifying common deviations in health status of clients of all ages. Prerequisite: Admission to the nursing program.

**NURS 3345. Healthcare Informatics for RNs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In this course students will examine theories and standards related to healthcare informatics. The course will explore the concept of digital literacy, protection and confidentiality of health information, and issues related to healthcare informatics and nursing care. Prerequisite: Admission to the nursing program.

**NURS 3348. Evidence Based Practice for RNs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The course is designed for students to develop skills as a consumer of research. The research process, critical appraisal of published research studies that use a variety of research designs, and the role of research in evidence-based practice are addressed. Prerequisite: Admission to the nursing program.

**NURS 3360. Family and Community-Based Nursing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course presents the theory and systems to provide family and community-based health care for individuals and families. Clinical experiences are individualized and will include public health departments, home health, community clinics and specialized care delivery settings. Prerequisites: Admission to the Nursing Program and successful completion of Level I courses. Lab fee: $2.

**NURS 3415. Lifespan Healthcare Delivery I for LVNs. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A conceptual based teaching approach building on foundational concepts and competencies throughout the lifespan. Healthcare exemplars direct utilization of the nursing process to assist in awareness of client changes in physiological integrity and beginning awareness of changes in psychosocial integrity. Prerequisite: Admission to the nursing program.

**NURS 3416. Care of Adults for Licensed Nurses. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Introduces a systematic conceptually based approach to patient centered care. Emphasizes the study of pathophysiologic and pharmacotherapeutic processes as the body responds to stress, injury, and disease. Focuses on evaluation of safe performance of direct care skills. Clinical experiences occur in the simulation lab and the acute care setting. This course is for LVNs admitted for BSN completion. Prerequisite: Pre- or corequisite NURS 3305. Lab fee: $2.

**NURS 3425. Lifespan Healthcare Delivery II for LVNs. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course uses a conceptual based process to focus on nursing care of medical-surgical patients across the lifespan. Emphasis is on clinical judgment, therapeutic and professional communication, realistic care planning, concept mapping and provision of safe, compassionate, multidimensional care in a variety of healthcare settings. Prerequisites: Admission to the nursing program and successful completion of Level I courses.

**NURS 3430. Nursing Pathophysiology/Pharmacology for LVNs. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course focuses on the pathophysiologic alterations, interactions, and effects of selected diseases across the lifespan, taking into consideration genetic, ethnic, environmental and cultural variables in pharmacologic and nursing management. Concepts of health promotion, disease prevention, disease progression, and treatment are approached from a cellular and multi-system perspective. Prerequisite: Admission to the nursing program.

**NURS 3440. Pathophysiology and Pharmacology for RNs. 4 Credit Hours (Lecture: 4 Hours, Lab: 0 Hours).**
This course focuses on the pathophysiologic alterations, interactions, and effects of selected diseases across the lifespan, taking into consideration genetic, ethnic, environmental, and cultural variables in pharmacologic and nursing management. Concepts of health promotion, disease prevention, disease progression, and treatment are approached from a cellular and multi-system perspective. Prerequisite: Admission to the nursing program.

**NURS 3510. Lifespan Healthcare Delivery I. 5 Credit Hours (Lecture: 3 Hours, Lab: 6 Hours).**
A conceptual based teaching approach building on foundational concepts and competencies throughout the lifespan. Healthcare exemplars direct utilization of the nursing process to assist in awareness of client changes in physiological integrity and beginning awareness of changes in psychosocial integrity Prerequisite: Admission to the nursing program.

**NURS 3520. Foundations of Nursing Care. 5 Credit Hours (Lecture: 3 Hours, Lab: 6 Hours).**
Introduces a systematic approach to patient-centered care. Emphasis is on understanding of knowledge, skills and attitudes fundamental to the discipline of nursing. Focuses on safe performance of direct care skills within the simulation lab and in hospital or long-term settings. Prerequisite: Admission to the Nursing program, NURS 3210. Lab fee: $2.

**NURS 3521. Lifespan Healthcare Delivery II. 5 Credit Hours (Lecture: 3 Hours, Lab: 6 Hours).**
This course uses a conceptual based process to focus on nursing care of medical-surgical patients across the lifespan. Emphasis is on clinical judgment, therapeutic and professional communication, realistic care planning, concept mapping and provision of safe, compassionate, multidimensional care in a variety of healthcare settings. Prerequisites: Admission to nursing program and successful completion of Level I courses.

**NURS 3623. Nursing Care for Adults. 6 Credit Hours (Lecture: 3 Hours, Lab: 9 Hours).**
Continues to utilize conceptual based process to focus on nursing care of adult medical-surgical patients. Emphasis is on clinical judgment, therapeutic and professional communication, realistic care planning, and provision of safe, compassionate, multidimensional care of adult patients in a variety of health care settings and simulation lab. Prerequisites: NURS 3210, 3520, and 3322. Lab fee: $2.

**NURS 4086. Nursing Problems. 4 Credit Hours (Lecture: 0-4 Hours, Lab: 0-4 Hours).**
This course allows the student to explore a topic of special interest while working independently under the guidance of an instructor. The student formulates objectives and a plan of evaluation of the project. May be repeated for credit, subject to approval by the head of the Department of Nursing. Prerequisite: Upper-division standing in the nursing major or approval of department head.

**NURS 4190. Synthesis for Professional Nursing Practice. 1 Credit Hour (Lecture: 0 Hours, Lab: 3 Hours).**
This course is the synthesis of the content taught throughout the BSN program. The concepts of patient centered care, safety, procedures, infection control, assessment, management of electronic health records (EHR) and increasingly complex disease processes are culminated in a simulated clinical setting. Prerequisites: Admission to the nursing program and successful completion of Level III courses.

**NURS 4245. Healthcare Informatics. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
In this course students will examine theories and standards related to healthcare informatics. The course will explore the concept of digital literacy, protection and confidentiality of health information, and issues related to healthcare informatics and nursing care. Prerequisites: Admission to the nursing program and successful completion of Level II courses.

**NURS 4301. Emergency Nursing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Refines the nursing process in caring for clients of all ages experiencing medical/surgical emergencies, psychosocial crises, and trauma. Clinical experiences include provision of emergency care to individuals and diverse populations in acute care facilities and rural community settings. Transcultural competencies and critical reasoning are reinforced. Pre- or corequisites: NUR 315, 321.

**NURS 4302. Transcultural Nursing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Considers assumptions about health, illness, and death that are deeply entwined within cultural, social, and religious beliefs. Alternative healing systems and practices in contemporary society will be explored, as well as differences between provider and client cultures. Clinical experiences among diverse ethnocultural populations will enhance self awareness and culturally competent care. Prerequisites: NUR 315, 321.

**NURS 4303. Nursing in the United Kingdom. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This is a study abroad course that examines nursing history, healthcare delivery, nursing practice and nursing education in the United Kingdom as compared to the United States. Study abroad is optional and at the student's expense. The course serves as an Applied Learning Experience (ALE).

**NURS 4308. Nursing Care of Infants and Children. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Utilizes a conceptual based process to focus on acute and chronic care, health promotion, injury prevention, disability and end of life issues in infants and children and the impact on their families. Emphasis is on culturally sensitive care and communication. Clinical experiences in acute care, simulation lab and community settings incorporate an interdisciplinary collaborative approach in the delivery of care. Prerequisites: NURS 3416 or 3623 and 3360. Lab fee: $2.

**NURS 4314. Policy, Politics, and Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines political structures and social forces that shape nursing and healthcare delivery. Communication strategies, conflict resolution, ethical resource management, quality improvement outcomes, and ethical decision making are addressed. Involvement in professional and policy making organizations is encouraged. Prerequisite: Admission to the nursing program.

**NURS 4318. Nursing Research, Inquiry, & Evidence-Based Decision-making. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The course is designed for students to develop skills as a consumer of research. The research process, critical appraisal of published research studies that use a variety of research designs, and the role of research in evidence-based practice are addressed. Prerequisites: Admission to the nursing program and successful completion of Level II courses.

**NURS 4350. Nursing Leadership in Healthcare. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
This course explores organizational practices and strategies, leadership theories and societal trends with implications for decision making in healthcare. Emphasizes leadership theories with practical application to issues in nursing leadership positions and healthcare. Clinical experiences focus on management of multiple patients in acute care and interactive observation of leaders and managers in a variety of settings. Prerequisites: Admission to the nursing program and successful completion of Level II courses.

**NURS 4360. Family and Community Health Nursing for RNs. 3 Credit Hours (Lecture: 2.5 Hours, Lab: 1.5 Hour).**
This course presents the theory and systems to provide family and community-based health care for families of all ages. Experiential learning is individualized and will include public health departments, home health, community clinics, nursing homes and specialized care delivery settings. Prerequisite: Admission to the nursing program.

**NURS 4394. Preparation for Professional Practice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course prepares the student for the transition into professional nursing practice. The impact of health care policy, emerging issues, and regulatory agencies on healthcare will be discussed. Self-care, preparation for NCLEX-RN, career planning, and life-long learning are emphasized. Prerequisites: Admission to the nursing program and successful completion of Level III.

**NURS 4410. Nursing Leadership and Management. 4 Credit Hours (Lecture: 2 Hours, Lab: 6 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Emphasizes leadership and management theories in practical application to issues arising in nursing management positions. Clinical experiences focus on management of multiple patients in acute care and interactive observation of leaders and managers in a variety of settings. Prerequisite: NURS 3623 Lab fee: $2.

**NURS 4413. Leadership and Management in Professional Nursing. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Examines leadership and management theories in practical application to issues arising in nursing middle management positions. Course designed for alternate entry students (LVN to BSN, RN to BSN, and RN to MSN). Clinical experiences with leaders and managers in a variety of settings will focus on improving patient care. Prerequisites: NURS 3305 and NURS 3416. Lab fee: $2.

**NURS 4425. Population and Global Perspectives in Nursing. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The course presents the theory and systems to provide health care services to communities and populations as units of care. Population-based assessment, program management, and resource development are addressed. Utilization of evidence-based practices to guide health teaching, health counseling, screening, outreach, disease and outbreak investigation, referral and follow-up is also emphasized. Prerequisites: Admission to the nursing program and successful completion of Level III courses.

**NURS 4440. Nursing Care of the Older Adult Family. 4 Credit Hours (Lecture: 2 Hours, Lab: 6 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Focus is on risk reduction, disease prevention, and strategies for health promotion, restoration, and maintenance in a vulnerable older population. Emphasis is placed on integrating assessment, data analysis, therapeutic communication, and critical thinking skills to direct culturally sensitive care of older adults. Clinical experiences are conducted in a variety of health care settings and the simulation lab. Prerequisites: Completion of previous level (Senior I) Lab fee: $2.

**NURS 4450. Nursing Leadership in Healthcare for RNs. 4 Credit Hours (Lecture: 3.25 Hours, Lab: 2.25 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course emphasizes leadership theories in practical application to issues arising in nursing leadership positions. Experiential learning focuses on identification of issues in nursing leadership, implementation of decision-making models, application of a change theory to implement evidence-based strategies and evaluation of outcomes. Prerequisite: Admission to the nursing program.

**NURS 4455. Population Health Nursing for RNs. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
The course presents the theory and systems to provide health care services to communities and populations as units of care. Population-based assessment, program management, and resource development are addressed. Utilization of evidence-based practices to guide health teaching, health counseling, screening, outreach, disease and outbreak investigation, referral and follow-up is also emphasized. Prerequisite: Admission to the nursing program.

**NURS 4498. Transition to Professional Nursing Practice. 4 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
Course fosters synthesis of the curricular concepts of communication, professionalism, critical thinking, patient centered care, diversity, and leadership as experientially gained in prior semesters. Immersion experience to promote transition to practice is facilitated. Prerequisites: Admission to the nursing program and successful completion of Level III courses.

**NURS 4535. Lifespan Healthcare Delivery III for LVNs. 5 Credit Hours (Lecture: 3 Hours, Lab: 6 Hours).**
This course continues to utilize conceptual based teaching processes focused on the care of clients experiencing complex health alterations across the lifespan. Emphasis is on clinical reasoning, therapeutic and professional communication, realistic care planning, concept mapping, and provision of safe, compassionate, multidimensional care in a variety of settings. Prerequisites: Admission to the nursing program and successful completion of Level II courses.

**NURS 4560. Transition to Professional Nursing Practice. 5 Credit Hours (Lecture: 2 Hours, Lab: 9 Hours).**
Course fosters synthesis and validation of the curricular concepts gained in prior semesters. Immersion experience to promote transition to practice is based in a rural locale to facilitate study of the geopolitical aspects of a particular manageable and measurable setting. Time will be dedicated to administering standardized tests used in assessing some student learning outcomes. Prerequisites: Successful completion of all graduation requirements with the exception of concurrent enrollment in NURS 4425 and 4440. Lab fee: $2.

**NURS 4612. Nursing Care of Adults with Complex Needs. 6 Credit Hours (Lecture: 3 Hours, Lab: 9 Hours).**
Comprehensive care of the adult experiencing complex health alterations within the framework of human caring. Clinical experiences occur in specialty settings and simulation lab. Prerequisite: NURS 3416 or 3623. Lab fee: $2.

**NURS 4630. Lifespan Healthcare Delivery III. 6 Credit Hours (Lecture: 3 Hours, Lab: 9 Hours).**
This course continues to utilize conceptual based teaching processes focused on the care of clients experiencing complex health alterations across the lifespan. Emphasis is on clinical reasoning, therapeutic and professional communication, realistic care planning, concept mapping, and provision of safe, compassionate, multidimensional care in a variety of settings. Prerequisites: Admission to the nursing program and successful completion of Level II courses.

**NURS 5086. Problems in Nursing. 6 Credit Hours (Lecture: 0-6 Hours, Lab: 0-6 Hours).**
Independent study focused on an area in nursing. Together with the faculty, the student formulates learning objectives and a plan for the course. May be repeated for credit as topics vary. Prerequisites: Admission to the MSN program and approval of the Department Head.

**NURS 5300. Nursing Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explores the relationships among theory, knowledge, science, and evidence-based nursing practice. The student will develop an appreciation of the process of theory development in nursing, compare and contrast various theoretical perspectives, and apply nursing theory. Course Fee $50.

**NURS 5301. Organizational Behavior and Human Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course explores organizational behavior by investigating characteristics of employees, leaders, groups (including teams), and culture. Practical strategies to manage human resources are identified, investigated, and discussed. Opportunities for self-exploration are present. Prerequisite: Admission to the MSN program.

**NURS 5303. Advanced Nursing Role Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Course introduces development in the areas of healthcare policy, politics, and issues; leadership; team building; and written and oral communication. Self-awareness and communication techniques will be emphasized. Students are expected to incorporate the values of lifelong learning and professional development. Prerequisite: Admission to the MSN program.

**NURS 5306. Nursing Informatics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explores nursing informatics, its value, impact, and application to nursing practice, research, and education. Advances in information technology, healthcare information systems, and tele-health are expanded.

**NURS 5310. Leadership Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will examine the dimensions of the leadership role; identification of attributes, knowledge and skill required to fulfill the role; and the distinctions between management and leadership. Opportunities for self-awareness are provided in the course. Leadership is explored through the process of developing oneself as a leader. Prerequisite: Admission to the MSN program.

**NURS 5312. Advanced Health Assessment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on enhancing previously learned nursing skills and techniques used in comprehensive health assessment. Facilitates the development of critical thinking and advanced communication skills using various modalities. Course Fee $50.

**NURS 5314. Advanced Pharmacology and Pathophysiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Dual focus on the role of the nurse in management of pharmacotherapeutics across the lifespan and the analysis and evaluation of physiologic and pathologic changes.

**NURS 5320. Healthcare Finance. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Offers an introduction to decision making in healthcare settings using accounting and finance theories, principles, concepts and techniques most important to managers. Course Fee $50.

**NURS 5322. Healthcare Change and Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines change theory, team building, negotiation, and managing conflict in the healthcare habitat. Also addresses foundational principles of strategic planning. Evidence-based communication processes and orchestrating change in complex healthcare systems will be discussed. Course Fee $50.

**NURS 5324. Outcomes & Eval Healthcare. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on healthcare outcomes management and planning using the biopsychosocial spiritual approach of healthcare delivery. The course will also examine a number of different measuring methodologies and their strengths and weaknesses as they apply to healthcare outcomes management and planning.

**NURS 5328. Administrator Role I. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Course is an applied synthesis of concepts, theories, processes, and roles learned in previous and concurrent core and administration courses. Students are actively engaged with faculty and practicum preceptor to plan experiences to meet course objectives. Students will gain firsthand experience with the operational, administrative, and strategic issues of concern to middle management. 60 hour practicum experience with preceptor. Prerequisite: Admission to the MSN Program.

**NURS 5329. Administrator Role II. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Continuation course of applied synthesis of concepts, theories, processes, and roles learned in previous and concurrent core and administration courses. Students are actively engaged with faculty and practicum preceptor to plan experiences to meet course objectives. Students will gain firsthand experience with the operational, administrative, and strategic issues of concern to executive management. 60 hour practicum experience with preceptor. Prerequisite: Admission to the MSN Program.

**NURS 5330. Instructional Methods and Strategies for Adult Learners. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focus is on teaching and learning theories, characteristics of the learner and instructor, and diverse learning designs and environments. Legal and ethical aspects will be covered. Prerequisite: Admission to the MSN Program.

**NURS 5332. Curriculum Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on curriculum development in nursing education and practice settings. Includes curriculum leader, faculty, and staff development, assessment of contextual factors, and curriculum design and process. Course Fee $50.

**NURS 5334. Outcomes and Evaluation Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Course describes assessment, outcomes, and evaluation in nursing education; the process for collecting data and making decisions; and how to construct meaningful evaluation instruments. Social, ethical, and legal responsibilities and implications of decisions are presented. Course Fee $50.

**NURS 5338. Clinical Focus Role. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Course begins with a discussion between the student and faculty and then student and preceptor to design an individualized experience to meet the course objectives. During this supervised practicum experience, the student will integrate advanced nursing knowledge to implement nursing interventions that influence healthcare outcomes for individuals, populations or systems. 60 hour practicum experience with preceptor. Prerequisite: Admission to the MSN Program.

**NURS 5339. Educator Role. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
Course is an applied synthesis of concepts, theories, processes, and roles learned in prior and concurrent education and core courses. Students are actively engaged with faculty and practicum preceptor to plan experiences to meet course objectives. 60 hour practicum experience with preceptor. Prerequisite: Admission to the MSN Program.

**NURS 5373. Nursing Administration Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students are expected to synthesize the concepts, theories principles, roles, and skills earned in this graduate program. Focus is on development of a scholarly product for dissemination. Course must be completed in one semester.

**NURS 5380. Completion Project. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focus is implementation of approved project proposal. Students are expected to synthesize the concepts, theories, principles, roles, and skills learned in this graduate program. Course must be repeated for project completion. Student will receive pass/fail credit in the course during the semester the project is completed.

**NURS 5383. Nursing Education Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students are expected to synthesize the concepts, theories principles, roles, and skills earned in this graduate program. Focus is on development of a scholarly product for dissemination. Course must be completed in one semester.

**NURS 5388. Thesis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin thesis. No credit until thesis is complete. Thesis will be completed following the guidelines from the College of Graduate Studies. Prerequisites: NURS 5398 and approval of Thesis Chair or Department Head.

**NURS 5398. Nursing Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Prepares students to explore, appraise, synthesize, and utilize appropriate research findings to address nursing problems and improve outcomes. Introduces research and knowledge generation in nursing. Course Fee $50.

# Nutrition

## Courses

**NUTR 1316. Principles of Food Preparation. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Study of food, food composition, and scientific principles involved in food preparation. Can receive credit for either NUTR 1316 or FDSC 1316.

**NUTR 3321. Life Cycle Nutrition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explores in depth the contribution that diet and nutrition make to support growth and the development process throughout the life cycle. Examines the distinct set of nutritional priorities for each stage of the life cycle with a focus on health promotion and disease prevention as underlying lifetime goals. Prerequisite: WSES 1322 or HECO 1322.

**NUTR 3325. Advanced Meal Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Fundamentals of nutrition and food preparation in all types of meal service. Special emphasis is on time and money management. Credit will be given for only one of the following: WSES 3325, FDSC 3325, or NUTR 3325.

**NUTR 4315. Medical Nutrition Therapy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Physiological basis and application of medical nutrition therapy using the nutrition care process as related to specific health conditions. Medical terminology, nutrition assessment techniques and case studies. May receive credit for either WSES 4315 or NUTR 4315. Prerequisite: HECO 1322.

# Public Health

## Courses

**PBHL 1310. Health and Society: An Introduction to Public Health. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the structure of the United States health care system and major issues in the delivery of quality health care. The course focus is upon the interaction of individual, societal, and policy aspects of health care in a changing health care delivery system.

**PBHL 2310. Introduction to Epidemiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to introduce the public health student to the methodology used to study incidence, prevalence and risk factors associated with human disease. Students will develop practical skills used in public health to design and interpret epidemiologic studies and an understanding of the application of evidence-based medicine to increase quality of medical care.

**PBHL 2320. Medical Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides a foundation of ethical issues in both medical practice and public health administration. A foundation consisting of concepts from philosophy and political science will be provided in the context of both historical and current events.

**PBHL 3310. Principles of Health Promotion and Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview of the types of programs in the field of health education and health promotion and techniques utilized in a variety of community settings. Discussion includes social behavior in individual health decisions and the role of the educator to provide motivational tools that lead to healthy lifestyles. Ethical issues and measures of success in health interventions are also considered.

**PBHL 3320. Statistics for Health Care. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
Practical applications of general principles of descriptive and inferential statistics used in health care research. Topics include statistical principles, descriptive statistics, regression analysis, study design, vital statistics and reportable diseases or conditions. Mastery of basic methods in statistical analysis will be enhanced by the utilization of statistical software. Prerequisites: PBHL 2310.

**PBHL 4080. Seminar and Internship in Public Health. 3-4 Credit Hours (Lecture: 3-4 Hours, Lab: 0 Hours).**
Comprehensive and integrated application of knowledge and skills acquired in the Public Health program in a practical setting. Success will depend upon the ability to demonstrate professional competence in public health practice. The 3 credit hour course is available for Public health Concentrations I and III and the 4 credit hour course is available for Concentration II only.Prerequisites: Approval of Program Director or major in Public Health.

**PBHL 4305. Issues and Trends in Health Care. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is designed to explore and discuss concepts and issues that are pertinent to allied health care professionals including legal and regulatory issues, health service reform and cost containment, workforce development, and quality assurance practices. Credit for both HPTC 4305 and PBHL 4305 will not be awarded.

**PBHL 4310. Introduction to Health Management and Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Examines the structure of health care systems and policies that impact health programs and financing of health services. Emphasis is placed upon planning and management issues in various health care delivery organizations.

**PBHL 4320. Public Health Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Introduction to laws and regulations governing health care professionals and medical institutions. Class discussions examine the balance between individual rights and health care providers' activities with public health powers and community health needs. The course includes bioethical principles underlying public health and health care practice.

**PBHL 4350. Pathophysiology for the Health Professionals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will focus on presentation of interrelationships between normal body functioning and the physiologic changes that participate in disease production, and occur as a result of disease. Emphasis on major disorders and other selected disorders provides a concise, easy-to-understand introduction to the fundamentals.

# Philosophy

## Courses

**PHIL 1301. Introduction to Philosophy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the writings of major philosophical authors.

**PHIL 2303. Introduction to Logic. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will introduce the student to the basic principles and concepts of formal logic, formal and informal fallacies, deductive and inductive reasoning, truth tables, symbolic notation, Venn diagrams, and the logic of scientific method. It will also include consideration of the philosophical foundations of logic.

**PHIL 3301. Ethics in the Professions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will consider both the responsibilities inherent in a profession as such and some of the specific ethical dilemmas that arise in particular professions: business, science, engineering, military, education, medicine, etc. Prerequisite: Junior classification.

**PHIL 3304. World Religions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the philosophical, ethical, and social dimensions of the religions of the world. Focuses on major religions but lesser known ones may be included. The course will emphasize the diversity of religious experience and traditions. Credit for both PHIL 3304 and RELI 3304 will not be awarded.

**PHIL 3309. History of Christianity and Christian Thought to the Reformation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An overview of the history of Christianity and Christian thought from founding to the beginnings of the Reformation with particular attention to major themes, movements, events, leaders, and developments within their social, cultural and political contexts. The course also offers an introduction to the central ideas and debates that have shaped the historical development of Christian theologies, practices, and institutions. Credit for PHIL, RELI, and HIST 3309 will not be awarded.

**PHIL 3311. Political Philosophy I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Philosophical ideas concerning basic political problems from the Classical Period through the Renaissance. Credit for both PHIL 3311 and POLS 3311 will not be awarded. Prerequisite: PHIL 1301 (Philosophy minor), POLS 2304 (Political Science majors), GOVT 2305, GOVT 2306 or approval of department head for Political Science majors.

**PHIL 3312. Political Philosophy II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Philosophical ideas concerning basic political problems since the Early Modern period. Credit for both PHIL 3311 and POLS 3312 will not be awarded. Prerequisite: PHIL 1301 (Philosophy minor), POLS 2304 (Political Science majors), GOVT 2305, GOVT 2306 or approval of department head for Political Science majors.

**PHIL 4086. Problems in Philosophy. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Independent reading, research, and discussion. Entry into this course will be arranged with the instructor and department head.

**PHIL 4305. Environmental Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An inquiry into how humans ought to relate to nature, including questions about the moral standing of animals and other non-human beings, environmental justice, and what we may owe to future generations. In addition to exploring universal ethical issues concerning our relationships with the environment, the course will also consider exemplary American and Texan nature writers.

**PHIL 4385. Philosophy Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of major philosophical issues and theories. May be repeated for credit as topic varies. Prerequisite: Junior classification or approval of department head.

**PHIL 5305. Environmental Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An inquiry into how humans ought to relate to nature, including questions about the moral standing of animals and other non-human beings, environmental justice, and what we may owe to future generations. In addition to exploring universal ethical issues concerning our relationships with the environment, the course will also consider exemplary American and Texan nature writers.

**PHIL 5385. Philosophy Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Content varies according to the needs and desires of students. When topic varies, course may be taken for credit more than once.

# Physics

## Courses

**PHYS 1302. Essential Elements of Physics. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
This course introduces fundamental physics and astronomy concepts to students planning to become elementary and middle school teachers. Students are expected to design and conduct inquiry based experiments including the development of hypothesis, collection and analysis of data, and the use of appropriate laboratory equipment. Topics include motion, forces, energy, waves, light, electricity, magnetism, stellar and planetary evolution, and the atom. Enrollment in this course is restricted to Interdisciplinary Studies majors. Prerequisite: MATH 1314. Lab fee: $2.

**PHYS 1401. College Physics I. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An introduction to mechanics, heat, and wave motion. This course is a trigonometry-based physics course. A student cannot get credit for PHYS 1401 if credit has been previously received for PHYS 2425. Prerequisite: MATH 1316, MATH 2412, MATH 2413 or concurrent enrollment. Lab fee: $2.

**PHYS 1402. College Physics II. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An introduction to electricity and magnetism, light, and modern physics. This is a trigonometry-based physics course. Prerequisite: PHYS 1401. A student cannot get credit for PHYS 1402 if credit has previously been received for PHYS 2426. Lab fee $2.

**PHYS 1403. Stars and Galaxies. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A laboratory science course of study in topics of astronomy and astrophysics, including the sun and its source of energy, stellar formation and evolution, black holes, galaxies, cosmology, and the creation and evolution of the universe. Prerequisite: two semesters of high school algebra or MATH 0304. Lab fee: $2.

**PHYS 1410. Great Ideas of Physics. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Great Ideas of Physics is a laboratory science course designed to introduce the student to the concepts of physics in an elementary mathematical setting, and to discuss their significance to science, technology, and society. Topics will be drawn from both classical and contemporary physics. Prerequisite: Two semesters of high school algebra or MATH 0304. This course cannot be used for credit toward a degree in physics or mathematics. Lab fee: $2.

**PHYS 1411. Introductory Astronomy I. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A laboratory science course of study in the topics of astronomy and astrophysics, including the history of astronomy, Kepler's laws, gravitation, formation of the solar system, asteroids, comets, meteors, a detailed survey of the planets and their evolution, and discussion on the possibility of extraterrestial life in the universe. Prerequisite: Two semesters of high school algebra or MATH 0304. Lab fee: $2.

**PHYS 2425. University Physics I. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This is an introduction to mechanics, heat, and wave motion. This is a calculus-based physics course. Prerequisite: MATH 2413 or concurrent registration. Lab fee: $2.

**PHYS 2426. University Physics II. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This is an introduction to electricity, magnetism, optics, and modern physics. Prerequisites: PHYS 2425 and MATH 2414 or concurrent registration. Lab fee: $2.

**PHYS 3331. Mechanics I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Particle dynamics in one, two, and three dimensions; conservation laws; dynamics of a system of particles; motion of rigid bodies; central force problems. Prerequisites: PHYS 2426; MATH 3306 and MATH 3433 or concurrent registrations.

**PHYS 3332. Electromagnetic Field Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Electrostatics; Laplace's equation; the theory of dielectrics; magnetostatic fields; electromagnetic induction; magnetic fields of currents; Maxwell's equations. Credit for both ELEN 3332 and PHYS 3332 will not be awarded. Prerequisites: PHYS 2426, MATH 3306 and MATH 3433, or concurrent registrations.

**PHYS 3333. Thermodynamics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Concept of temperature, equations of state; the first and the second law of thermodynamics; entropy; change of phase; the thermodynamics functions. Prerequisites: PHYS 2426 (Prerequisite); MATH 3433 (Co-requisite).

**PHYS 3334. Modern Physics I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Foundations of the atomic theory of matter; kinetic theory; elementary particles; radiations; atomic model; atomic structure; atomic spectra and energy levels; quantum theory of radiation; x-rays; special theory of relativity. Prerequisites: PHYS 2426 (Prerequisite); MATH 3433 or MATH 3306 (Corequisite).

**PHYS 3350. Medical Physics I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course will provide an introduction to the physics of human physiological processes as well as the physics used in the design of medical diagnostic tools and techniques. Prerequisite: PHYS 2426 or consent of the instructor.

**PHYS 4086. Special Problems. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
This course is designed to develop the theoretical or experimental capabilities, or both, of individual senior physics majors. Prerequisites: Senior classification and approval of department head.

**PHYS 4161. Physics Research Project. 1 Credit Hour (Lecture: 1 Hour, Lab: 2 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Literature survey and preparation for, and initiation of, a research project agreed to between the student and a faculty advisor, to be completed and reported on in the Research Seminar course. Prerequisites: PHYS 3334.

**PHYS 4162. Physics Research Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An experimental or theoretical project will be continued by the student and the results reported in a seminar. Students who have not yet taken the ETS Physics field test are required to do so while enrolled in Seminar. Prerequisites: PHYS 4161.

**PHYS 4303. Astronomy and Astrophysics. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
A laboratory science course of study in the topics of astronomy and astrophysics, including Planetary Astronomy, Stellar Astrophysics, Galactic Astronomy, Cosmology and Astrobiology. Prerequisites: MATH 2413, PHYS 2425. Lab fee $8.

**PHYS 4330. Mathematical Methods for Physicists and Engineers. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Mathematical techniques from the following areas: infinite series; integral transforming; applications of complex variables; vectors, matrices, and tensors; special functions; partial differential equations; Green's functions; perturbation theory; integral equations; calculus of variations; and groups and group representatives. Credit for both ENPH 4330 and PHYS 4330 will not be awarded. Prerequisite: MATH 3306, 3433.

**PHYS 4332. Optics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Huygen's principle applied to geometric optics; interference; diffraction; polarization; crystal optics; electromagnetic theory of light; interaction of light with matter. Prerequisites: PHYS 2442 and MATH 3306.

**PHYS 4334. Modern Physics II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The constitution of the atomic nucleus; natural radioactivity; artificially induced nuclear transmutations; alpha, beta, and gamma decay; nuclear reactions; nuclear structure and nuclear forces; nuclear fission; neutron physics. Prerequisites: PHYS 3334 and MATH 3306 or concurrent registration.

**PHYS 4335. Quantum Physics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The Schroedinger equation; one dimensional systems; the Heisenberg uncertainty principle; magnetic moments and angular momentum; two and three dimensional systems; approximation methods; scattering theory. Prerequisite: PHYS 3334 (Prerequisite); MATH 3306 or MATH 3433 (Co-requisite).

**PHYS 4336. Solid State Physics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The basic ideas of physics are applied to the understanding of the properties of crystalline materials to include the definition of such materials, electrical and thermal conductivity, heat capacity, crystalline binding, the nature of metals, insulators, and semiconductors, dielectric properties, and magnetic properties. Credit for both ELEN 4336 and PHYS 4336 will not be awarded. Prerequisite: PHYS 3334; MATH 3306 or concurrent registration.

**PHYS 4337. Nuclear Physics and Techniques. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The study of nuclear phenomena and properties including mass, stability, magnetic moment, radioactive decay processes and angular momentum. The use of nuclear techniques to analyze problems in other fields of engineering with a special emphasis on the characterization of electronic materials. Prerequisite Course: PHYS 3334.

**PHYS 4340. Advanced Physics Laboratory. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A laboratory course focusing on advanced techniques and experiments drawn from the full range of physics classes. The student will understand the role of experimental design, advanced data analysis and reduction, error analysis, and the use of computers while investigating physical phenomena. Prerequisites: Corequisite: PHYS 3334. Lab fee: $30.

**PHYS 4350. Medical Physics II. 3 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
The course covers the physics of ionizing radiation and its application in areas of medical physics, radiation safety, and manufacturing.Prerequisite: PHYS 3334 or consent of instructor. Lab fee $8.

**PHYS 440. Advanced Physics Laboratory. 3 Credit Hours (Lecture: 1 Hour, Lab: 4 Hours).**
A laboratory course focusing on advanced techniques and experiments drawn from the full range of physics classes. The student will understand the role of experimental design, advanced data analysis and reduction, error analysis, and the use of computers while investigating physical phenomena. Co-requisite: PHYS 334.

**PHYS 5303. Astronomy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics in astronomy appropriate for public school teachers. Course may be repeated when topic changes.

# Political Science

## Courses

**POLS 2304. Introduction to Political Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the discipline of political science, with particular emphasis devoted to its development in the modern era. Topics include degree concentrations available in the program, types of political institutions, uses of political science, participation by political scientists in public affairs and public policy, an introduction to research and writing in the discipline, political theory and other discipline theories, and career options available to political science majors. Prerequisites: GOVT 2305 or GOVT 2306 or approval of the department head.

**POLS 3301. Political Economy of Globalization. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This class introduces students to the political system that manages the global economy. The class looks at theoretical approaches to economic conflict and cooperation, global trade, and global finance. Students will also study problems associated with the global economic system including poverty, inequality, and environmental externalities.

**POLS 3302. Elections and Political Parties. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the electoral process in American national, state, and local political systems. Emphasis will be placed on the evolution of the structure and functions of political parties, interest groups, the news media, and other participants in the electoral process. Prerequisites: GOVT 2305, 2306.

**POLS 3303. Comparative State and Local Government and Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Variations and similarities in the practice of politics and in the administration of government in the states. Particular attention is given to local government and state-national relations. Prerequisites: GOVT 2305, 2306.

**POLS 3304. The Executive. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the organization of executive power in American national, state, and local systems. Emphasis will be placed on the evolution of the structure and functions of the Presidency of the United States and national, state, and local bureaucracies, and the role of parties, legislatures, courts, interest groups, and other participants in the executive process. Prerequisites: GOVT 2305, 2306.

**POLS 3305. Legislation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the legislative process in American national, state, and local political systems. Emphasis will placed on the evolution of the structure and functions of the Congress and the state legislatures, and the role of executives, courts, parties, interest groups, and other participants in the legislative process. Prerequisites: GOVT 2305, 2306.

**POLS 3307. Public Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the concepts and practices of American public administration. Prerequisites: GOVT 2305, 2306.

**POLS 3308. International Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to concepts and theories of international politics. It covers the evolution of the contemporary nation-state system, the role of international governmental institutions, and conflict and cooperation among states. Prerequisite: GOVT 2305, 2306.

**POLS 3309. The Judiciary. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the organization of the judiciary in American national, state, and local systems. Emphasis will be placed on the structure and function of the courts, plus the roles of the executive and legislative branches in selecting judges and checking the power of the courts, and the roles played by interest groups and others in influencing the courts. Prerequisites: GOVT 2305 and 2306.

**POLS 3310. Environmental Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An introduction to the politics of environmental protection in America. The focus of the course is upon domestic environmental policy with particular attention paid to traditional media - air, water, and hazardous waste. Prerequisite: GOVT 2305, 2306.

**POLS 3311. Political Philosophy I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Philosophical ideas concerning basic political problems from the Classical period to the Renaissance. Credit for both PHIL 3311 and POLS 3311 will not be awarded. Prerequisites: GOVT 2305, GOVT 2306, and POLS 2304 or with approval of department head.

**POLS 3312. Political Philosophy II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Philosophical ideas concerning basic political problems since the Early Modern period. Credit for both PHIL 3312 and POLS 3312 will not be awarded. Prerequisite: GOVT 2305, GOVT 2306, POLS 2304 or department head approval.

**POLS 3314. Comparative Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to the politics of several nations in Europe, Africa, Latin America, and the Middle east. The course focuses on the analysis of major political developments in the post- World War II era leading to the present. Topics discussed include: the legacy of the past, governing structures and processes, and contemporary political debates. Prerequisites: GOVT 2305, GOVT 2306. Political Science majors are also required to take POLS 2304.

**POLS 3315. Sustainability. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explore the varied perspectives of sustainability and analyze factors that contribute to or decrease system sustainability. Investigation of the social, economic, and environmental barriers to achieving sustainable systems and options for overcoming these barriers. Credit will be awarded only for POLS 3315, ENVS 3315, or WSES 3315.

**POLS 3316. Political Science Research Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course introduces students to the process of conducting research in the social sciences. Material will focus on developing research questions and extrapolating hypotheses from them, correctly and accurately reviewing prior relevant literature and how/when to cite it, applying qualitative and quantitative methods, finding sources of data and developing a case study, understanding the IRB process, and preparing a research proposal that can be reviewed and refined in preparation for a Capstone project. Prerequisites: GOVT 2305, GOVT 2306, POLS 2304.

**POLS 3320. Terrorism and Political Violence. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the causes of terrorism and other forms of political violence, with particular emphasis on measures of prevention and counter-terrorism.

**POLS 4084. Internship. 3-6 Credit Hours (Lecture: 0 Hours, Lab: 16-30 Hours).**
Application and integration of academic study and development of skills in a field setting. Field projects include direction of a political campaign, internship in a city or county administrative office, or in a not-for-profit organization for analyzing or carrying out governmental policy. Minimum of 200 hours of work required for 3 hours of credit. Prerequisites: 2.5 overall grade point average, advanced standing, and approval of department head. Field experience fee $50.

**POLS 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Independent reading, research and discussion. Entry into this course will be arranged with the political science counselor.

**POLS 4301. Constitutional Law I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The origin and growth of the constitutional aspects of national power as shown by leading U.S. Supreme Court decisions on commerce, federalism, jurisdiction, money, monopolies, treaties, and war. Prerequisites: GOVT 2305, 2306, HIST 1301, 1302.

**POLS 4302. Constitutional Law II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The origin and development of constitutional prohibitions as shown by leading U.S. Supreme Court decisions on civil rights, contracts, due process, economic regulation, eminent domain, labor relations, obscenity, political utterance, and religion. Prerequisite: POLS 4301.

**POLS 4306. European Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Comparative examination of European politics and government, with particular attention to the European Union and policy processes at the nation-state and EU levels. This course may be conducted either as a regular seminar on campus or as part of a study-abroad opportunity. Students who take the course on campus may repeat it once for credit as a study-abroad opportunity, or vice versa.

**POLS 4307. Nationalism. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examination of theories of nationalism and national identity, origins of ethno-centric conflict, and impacts of national identity on political issues.

**POLS 4308. Politics of Latin America. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an analysis of contemporary political issues, economic development, militarism, and democratization in Latin America. In attempting to explain these phenomena, the course will focus on the shaping influences of such key factors as religion, gender, race, ethnicity, and the impact of external powers in shaping political events in the region. Prerequisites: GOVT 2305 and GOVT 2306.

**POLS 4309. Politics of the Middle East. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the history and politics of the Middle East in the 20th century. Specifically, this course will analyze such critical political, social, intellectual, and economic themes as colonialism, Arab nationalism, secular modernism, military conflict, the rise of political Islam, the status of women, and the oil revolution. Prerequisites: GOVT 2305 and GOVT 2306.

**POLS 4310. International Environmental Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An introduction to environmental politics and policy at the international level. The focus of this course is upon global environmental policy with particular attention paid to the processes that create and shape global environmental policy. Prerequisite: GOVT 2305, 2306.

**POLS 4311. Environmental Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Focuses on US environmental law and regulations including administrative law and common law. Major laws dealing with air, water, and hazardous waste will be assessed, including citizen participation within the legal process Prerequisite: GOVT 2305, GOVT 2306.

**POLS 4312. Religion and Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An examination of the major theories of the relationship of religion and politics and a survey of this relationship in the United States with a focus on religious liberty, church-state relations, and religious advocacy. Additional focus on Christian-majority states in Europe and the Americas and Muslim-majority states and the relationship of Islam and government, as well as critical contemporary issues. Students cannot receive credit for both POLS 4312 and RELI 4312. Prerequisites: GOVT 2305 and GOVT 2306.

**POLS 4313. Governments and Politics of East and South Asia. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Government organization and functions, political processes, and major developments in the political systems of Japan, China, Korea, India, Pakistan, and other states in East and South Asia from the 20th century to the present. Prerequisites: GOVT 2305 and GOVT 2306.

**POLS 4314. African Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to the major political issues and dynamics in sub-Saharan Africa, including traditional political systems, the effects of colonialism, political culture, public policy, the role of the military, domestic conflict, corruption, institutionalization, democratization, development, foreign aid, and regional integration. Prerequisite: Junior or Senior status or permission of the department head.

**POLS 4315. Foreign Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of America's role in the modern world. Particular emphasis is placed on the policy makers, for example, the President, Congress, the State Department, and the Department of Defense, and on external factors such as other nations. Prerequisites: GOVT 2305, 2306.

**POLS 4316. Conflict Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the causes of international and civil conflict, historical changes in the nature of war, and predictions of future conflicts.

**POLS 4317. Peace Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A seminar on the causes of peace, covering bargaining and war termination, social conflict resolution, international cooperation, and the ethics of peace.

**POLS 4320. Weapons of Mass Destruction. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines the physical and political effects of chemical, biological, and nuclear weapons, with emphasis on issues of deterrence and arms control.

**POLS 4321. Civil Wars and Military Intervention. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the causes, characteristics, and effects of civil wars, with particular emphasis on preventing the resumption of warfare after peace agreements. The effect of military intervention on the outcome and recurrence of civil war is studied in detail.

**POLS 4340. US Public Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an overview of the development of public policy in the United States and offers students the opportunity to understand this process in relation to their research interests. A major research project on a specific policy issue is developed over the course of the term. Credit will not be awarded for both POLS 4340 and POLS 5340. Prerequisites: GOVT 2305 and GOVT 2306.

**POLS 4380. Administration of Justice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Analyzes the structure, function, and interrelationship of the components of the criminal justice system at the federal, state, and local levels. The history and philosophy of criminal justice in a democratic society will be included.

**POLS 4385. Political Science Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Independent reading, research, discussion, and paper writing, under personal direction of instructor. Prerequisites: Senior classification, 18 hours POLS, or approval of department head. May be taken more than once for credit.

**POLS 4390. Political Science Capstone Course. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course requires students to integrate and use fundamental concepts learned in previous political science courses to research and analyze real-world political phenomena and problems. Students will present oral and written reports on their research, supplemented by appropriate internet and multimedia materials, as well as portfolios documenting their research. Prerequisite: SOCI 4302 or POLS 3316 or Senior status or permission of the department head.

**POLS 5086. Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Conference course. Independent reading, research, discussion, under supervision of senior professor.

**POLS 5310. International Environmental Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to environmental politics and policy at the international level. The focus of this course is upon global environmental policy with particular attention paid to the processes that create and shape global environmental policy.

**POLS 5311. Environmental Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focuses on US environmental law and regulations including administrative law and common law. Major laws dealing with air, water, and hazardous waste will be assessed, including citizen participation within the legal process.

**POLS 5330. Public Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The practical application of theories of public administration, the study of problems of administrative management in public organizations, and the use of law for administrative decision-making.

**POLS 5340. US Public Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an opportunity to review theory and elements of the development of public policy in the United States and to analyze this process in relation to research interests. A major research project on a specific policy issue is developed over the course of the term. Credit will not be awarded for both POLS 4340 and POLS 5340. Prerequisites: GOVT 2305 and GOVT 2306.

**POLS 5360. Political Culture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of political culture as it forms and is formed by public policy. Examples may include the culture of environmental policy, bureaucratic policy, foreign policy, and others.

**POLS 5361. Politics of Education. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the relationship between politics and education in America including K-12 and post-secondary systems.

**POLS 5362. Environmental Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the politics of the natural environment with emphasis on the role of government in environmental protection.

**POLS 5385. Political Science Seminar. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Contents vary according to the needs and desires of students. Independent reading, research, discussion, and writing under personal direction of instructor. May be repeated once for credit when topic varies.

**POLS 5388. Thesis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Scheduled when student is ready to begin thesis. No credit until thesis is accepted.

**POLS 5399. Practicum, Field Problem, or Internship. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Supervised professional activities in school administration, counseling, supervision, college or public school teaching, or other public service professions. Major emphasis is placed on the student's involvement in successful practices in the area of professional interest. May be repeated once for credit. Field experience fee $50.

# Psychology

## Courses

**PSYC 1100. Transitioning to University Studies in Psychology. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, and in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. Also included will be the development of skills to promote physical and mental health.

**PSYC 2301. General Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview of psychology, the scientific study of human behavior and mental processes and the variables that influence these processes. Topics covered in the course include motivation, emotions, intelligence, sensory processes, perception, learning, thinking, mental health, and psychotherapy. All psychology majors must earn a C or better in the course.

**PSYC 2308. Child Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of children from infancy through adolescence with emphasis on the analysis of behavior based on experimental evidence and contemporary theory.

**PSYC 2314. Life Span Growth & Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A lifespan study of the development of human beings from conception to death. The growth and developmental patterns of the eight age groups are studied with attention directed to experimental evidence, case studies, and contemporary theories. May not be counted as part of the professional education component for teacher certification.

**PSYC 2315. Psychology of Adjustment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of human behavioral and mental processes that permit us to adjust or to meet the demands of a changing physical or psychological environment with an emphasis upon effective personal-social adjustment. Topics covered include social influence, stress, psychological factors and physical health, health-enhancing behaviors, addictive behaviors, methods of coping, gender roles and differences, and interpersonal attraction.

**PSYC 2317. Statistical Methods in Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of statistical methods used in psychological research, assessment, and testing. Includes the study of measures of central tendency and variability, statistical inference (including analysis of variance), and correlation and regression as these apply to psychology. All psychology majors must earn a C or better in the course. Prerequisites: PSYC 2301 and MATH 1314 or higher.

**PSYC 2319. Social Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the theories and topics of social psychology. This course emphasizes the effect of social variables upon the behavior of individuals. Topics covered include socialization, language and communication, prejudice, social attitudes, attitude change, aggression, prosocial behavior, and group behavior. Prerequisite(s): PSYC 2301 or approval of the department head. Prerequisite: PSYC 2301 or approval of the department head.

**PSYC 2320. Abnormal Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview of the history, causes, and treatments of deviant behavior. Psychological, social, and physiological factors as they relate to the development of abnormal behavior and its subsequent treatment. Prerequisite: PSYC 2301 or approval of the department head.

**PSYC 2345. Biological Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introductory course in the biological and neuroscientific basis of behavior with emphasis on how the brain influences behavior. The basic chemical, electrical, and functional components of the nervous system that influence behaviors, cognition, and emotion will be examined. Prerequisite: PSYC 2301.

**PSYC 3301. Psychology of Learning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An investigation into the major theoretical approaches, concepts and principles, and experimental methods of learning. All psychology majors must earn a C or better in the course. Prerequisites: PSYC 2301 - must pass this course with a C or better, or approval of the department head.

**PSYC 3303. Educational Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the psychology of learning within educational settings. Topics include theories and research on human development, cognition, learning, and motivation, and their application to the processes of teaching and learning. Issues such as cultural diversity, standardized testing, individual differences, exceptionalities, and the learning environment are also considered.

**PSYC 3305. Human Cognitive Processes. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of human cognition and information processing, including perception, attention, memory, reasoning, and problem solving. Also included are the experimental methods and current theories of human cognition. Prerequisite: PSYC 2301 or approval of the department head.

**PSYC 3307. The Human Lifespan. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Surveys development from conception through adulthood with emphasis on social adaptation of individuals and roles in families, groups, and communities. Cognitive, social, personal and biological factors of the stages of development are included.

**PSYC 3309. Writing in Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The study of advanced technical communication in psychology. Involves learning and using the current edition of the Publication Manual of the American Psychological Association for formal research reports, literature reviews, grant proposals, and professional articles. Also involves learning to write professional psychological reports. Psychology majors must pass the course with a C or better. Prerequisite: PSYC 2301 with a C or better.

**PSYC 3311. Behavior Analysis and Behavior Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines the basic principles and methods of behavior analysis and behavior management techniques. Includes a systematic review of behavioral and cognitive-behavioral methodologies for dealing with human problems such as disruptive behavior, personal adjustment difficulties, behavioral deficits, phobias and fears, developmental disorders, stress and maladaptive behavior in a variety of settings. Prerequisite(s): PSYC 2301 or approval of the department head.

**PSYC 3320. Psycholinguistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course emphasizes the study of language, understanding languages, producing language and speech, language development, and related topics such as reading, language and the brain, linguistic diversity, and universals. Prerequisite Course(s): PSYC 2301 or approval of the department head.

**PSYC 3332. Neuropsychopharmacology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the neuroscientific basis of the effects of drugs on behavior. Emphasis will be placed on major antipsychotic, antianxiety, and antidepressant drugs and their clinical use and side effects. Drug abuse such as alcohol, marijuana, and cocaine will also be reviewed. Prerequisite: PSYC 2301 AND 8 hours of lab science.

**PSYC 3340. Child Psychopathology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will cover psychological disorders affecting children, the ways in which they differ in presentation from childhood to adulthood, and the developmental impact of childhood psychological disorders. The causes, nature, identification, and treatment of behavioral and emotional disorders in children will be addressed. Prerequisite: PSYC 2301.

**PSYC 3350. Personality. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to personality, which is the unique and relatively stable patterns of behavior, thoughts, and feelings that make human beings different. Various theoretical approaches - psychodynamic, cognitive, behavioral, humanistic, and existential - will be covered and will be related to personality and personality development. Prerequisite: PSYC 2301 or approval of department head.

**PSYC 3360. Sport Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide students with an overview of the theories and research related to sport and exercise behavior. Topics to be covered include the history of sport psychology, behavioral principles, anxiety, motivation, leadership, group dynamics, gender, and personality. The course will also be designed to relate these principles to exercise and sport performance. Prerequisite: PSYC 2301 or approval of department head.

**PSYC 3435. Principles of Research for the Behavioral Sciences. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The study of various research designs used in the behavioral sciences. Includes laboratory exercises to acquaint and give students hands-on experience with experimental procedures and basic and applied research. Experiences are also provided in developing a research proposal, obtaining approval and consent to conduct research, using statistical computer applications, and writing a research report. Ethical and legal issues in conducting research are also considered. Prerequisite: PSYC 3309 and 2317, must earn a C or better in the course. Lab fee: $2.

**PSYC 4086. Problems in Psychology. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Independent reading and research on various topics related to Psychology. Entry into the course will be arranged by the director of the Psychology program.

**PSYC 4301. Psychological Test and Measurement. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the principles of psychological testing. Includes the use and critical evaluation of tests of achievement, intelligence, aptitude, and personality. Prerequisites: PSYC 2301, MATH 1314 or higher, and PSYC 2317, or approval of the department head.

**PSYC 4302. Adaptive Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A consideration of how adaptation has influenced social, cognitive and developmental processes in humans. Comparisons between humans and other species, and between different human cultures will be included. Prerequisite(s): PSYC 2301 or approval of the department head.

**PSYC 4303. Animal Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the major areas of animal behavior research from a psychological perspective. Research examining the development and display of behaviors will include subject samples ranging from insects to humans conducted in natural, quasi-experimental, and experimental studies. Prerequisite: PSYC 2301 AND 8 hours of lab science.

**PSYC 4310. Industrial/Organizational Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the basic theories and practices of Industrial/Organizational psychology including selection testing, job analysis, performance appraisal training, employment motivation, job satisfaction, leadership and group processes within organizations. Prerequisite: PSYC 2301 or approval of department head.

**PSYC 4312. Behavioral Neuroscience. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Surveys the biological basis of behavior. Includes an in-depth examination of the physical structure of the human body and the role of chemical and electrical operations within it and how it influences psychological functioning. Emphasis will be placed on the developmental, cognitive, affective and behavioral effects of such operations. Recent research will also be reviewed. Prerequisite: PSYC 2301, 8 hours of lab science (preferably BIOL), or approval of the department head.

**PSYC 4320. History of Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Historical analysis of prescientific psychology including philosophical and physiological roots leading to the development of the early schools of psychological thought to current psychological theoretical positions. All psychology majors must earn a C or better in the course. Prerequisites: PSYC 2301 and PHIL 1301 or approval of department head.

**PSYC 4350. Senior Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A focus on the application, integration, and demonstration of knowledge gained throughout psychology major coursework. In this course, students will be expected to demonstrate the following: knowledge base in multiple areas of psychology, knowledge of methods of scientific inquiry and critical thinking, ethical and social responsibility, effective written and oral communication, and professional development. All psychology majors must earn a C or better in the course. Prerequisites: PSYC 3435 and 90 hours completed, or permission of the department head.

**PSYC 4388. Undergraduate Research Experience. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide students the opportunity to engage in research with faculty. Students will have the opportunity to gain experience working in a lab setting, which may include engagement in design, collection, analyzing, interpreting, writing and presenting data. Students must be currently working in a lab and be invited by a faculty member to take this course. Prerequisite: PSYCH 2301.

**PSYC 4390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Independent reading and research on various topics related to Psychology. Prerequisite: Senior standing.

**PSYC 5048. Applied Project Capstone. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
This course requires students to design and complete an independent project that integrates what the student has learned in the program and advances the application of the scientific principles of psychology. Students will communicate the results of their project via a written report and a public presentation.

**PSYC 5086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Directed independent study or research under the supervision of a member of the psychology faculty. Prerequisites: graduate standing and approval of department head.

**PSYC 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: Completion of all course work required by the degree and consent of the major professor.

**PSYC 5090. Special Topics. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
An examination of different topics each semester with a focus on contemporary issues in counseling. This course may be repeated for credit as the topic changes.

**PSYC 5300. Behavioral Statistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Review of descriptive statistics with emphasis on inferential statistics. Includes correlation, one-way and two-way analysis of variance, regression analysis and experimental design. Use of computer software with emphasis on experience with SPSS. Prerequisite: undergraduate statistics recommended.

**PSYC 5301. Research Methods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the scientific method of research, types of research and research design. Students are required to review, analyze and interpret research findings in their major field and develop a research project with the assistance of their instructor. Prerequisite: PSYC 5300 or equivalent graduate statistics course. Lab fee assessed.

**PSYC 5302. Social Psychological Processes. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in-depth examination of the individual in a social and cultural context. Topics include: the behavior of groups, the roles of individuals within groups, and the influence of groups on an individual¿s perceptions, attitudes, emotions, and behavior. Major theories and supporting research are covered. Includes a selected emphasis on specific topics, with individual or team projects and/or original research.

**PSYC 5303. Theories of Learning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of major theories of learning, factors which influence the process of learning, and application of these theories and processes to general and special populations. Prerequisite: Admission to Graduate School or approval of department head.

**PSYC 5304. Human Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A lifespan survey of the development of human beings from conception to death. Topics included will be research and theory into physical, cognitive, social, and personality development in each of the different age groups: prenatal, infancy, childhood, adolescence, and adulthood.

**PSYC 5315. Physiological Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the biological basis of behavior with an emphasis on the structure and biochemistry of the human nervous system. Includes an exploration of the interactive relationships between biological processes, psychopharmacology, genetics, neurological disorders, normal growth and maturation, perception, memory, emotion, stress, mental disorders, consciousness, and communication. Contemporary theories and research are investigated and critiqued.

**PSYC 5316. Advanced Quantitative Methods and Experimental Design. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an overview of advanced statistical techniques to analyze quantitative data resulting from experimental and quasi-experimental research designs. This course is a continuation of PSYC 5300 and 5301 and requires students to demonstrate proficiency in the use of SPSS for data analysis. The course reviews One-Way and Two-Factor ANOVA. Other topics include ANCOVA, MANOVA, MANCOVA, multiple regression, logistic regression, data reduction techniques (factor analysis and principal components analysis), and non-parametric analyses appropriate for two- and multi-group designs. The course emphasizes the integration of multivariate and advanced statistical design with applicable research paradigms.

**PSYC 5320. History and Systems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Historical analysis of the development of the science of psychology from early philosophical theories through the establishment of psychology as a science to modern theoretical positions.

**PSYC 5321. Evolutionary Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
In-depth evaluation of the current theories of adaptation with a large focus on how adaptation has influenced social, cognitive and developmental processes in humans. Evidence from cross-cultural studies as well as cross species studies will be reviewed and discussed.

**PSYC 5322. Psychometrics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Systematic treatment of the logic of measurement, including such topics as scaling models, validity, variance and covariance, reliability, theories of measurement error and test construction.

**PSYC 5361. Teaching of Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of pedagogical theories, styles, and strategies as they apply to college-level teaching of psychology. Students will explore a range of techniques for teaching of psychology courses, including presentation of course material, learning assessment tools, test construction, and grading.

**PSYC 5362. Teaching of Psychology Practicum. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
The Teaching of Psychology Practicum is designed to give students supervised practical application related to teaching experience within the realm of Psychology. Students will be paired with a current faculty member teaching, but not limited to, PSYC 2301 General Psychology and PSYC 1100 Transitioning to University Studies in Psychology courses. Prerequisite: Admission to Graduate School.

**PSYC 5379. Advanced Psycholinguistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course emphasizes linguistic principles, the perception of language, the mental lexicon, sentence and discourse comprehension, the production of speech and language, conversational interaction, first and second language acquisition, biological foundations of language, and related topics, such as reading, linguistic diversity, and cultural influences. Course is cross-listed with READ 5379. Credit will not be awarded for both READ 5379 and PSYC 5379.

**PSYC 5381. Assessment and Evaluation Fundamentals. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the nature and development of standardized tests, with emphasis on ethical standards, psychometric theory, test standards and test construction. Selection criteria and utilization of standardized and other instruments in various environments are considered. Includes evaluations and critiques of published tests and experiential exposure to different types of psychological tests.

# Reading

## Courses

**READ 0303. Basic Reading. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of ways a student may enhance existing reading and writing skills; evaluate and examine new theories of learning in relation to individual needs; develop problem solving abilities and critical thinking; acquire individual capacities for understanding oneself in relation to college expectations. The class will use relevant, pertinent materials designed to enrich a student's background knowledge.

**READ 3301. Introduction to Children's Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of literature for children grades EC – 8 focusing on the use of classic and contemporary texts to promote interest, motivation, and critical reading skills for self-selected reading. Credit will not be granted for READ 3301 and ENGL 3350. Prerequisites: ENGL 1301, 1302, and 3 hours of SOPH level ENGL.

**READ 3311. Literacy for the Early Years. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of research-based competencies essential for effective literacy instruction in the early years. Prerequisites: ENGL 1301, 1302, 3 hours SOPH ENGL and concurrent enrollment in READ 3321.

**READ 3321. Early Childhood Literacy Field Implementation. 3 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
This course is designed to give students field-based experiences in the early childhood classroom. Students will develop practical lessons and activities to be used in the literacy classroom and apply knowledge and skills about instructional strategies, materials, and best-practices in the early grades classroom. Prerequisite: Concurrent enrollment in EDUC 3320 or EDUC 3321.

**READ 3351. Content Area Literacy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an understanding of factors which influence learning from content text and teaches specific instructional strategies which promote comprehension, vocabulary development, effective study strategies, and test-taking skills. Prerequisites: ENGL 1301, ENGL 1302 and a Sophomore level English.

**READ 3356. Content Area Literacy for Interdisciplinary Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides an understanding of factors which influence learning from content texts. The course includes specific instructional strategies that promote comprehension, vocabulary development, effective study and test-taking skills, and ways to modify text for diverse learners including English Language Learners, Gifted and Talented, Special Education and other cultural groups. Attention is given to the principles of research-based reading instruction for EC-6 and 4-8 pre-service teachers. Prerequisites: ENGL 1301, ENGL 1302 and a Sophomore level English.

**READ 3384. Literacy for the Middle Years. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A field-based course surveying research-based competencies essential for effective literacy instruction in the middle years. Prerequisites: READ 3311, Concurrent enrollment in EDUC 3330.

**READ 4086. Reading Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course featuring independent research, reading, application and discussion under personal direction of instructor. Topics vary according to student need. Open to students of junior or senior classification who have been admitted to the Teacher Education Program and with approval of the instructor and department head.

**READ 4309. Reading and Writing Across the Curriculum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course focuses on theory and instructional strategies for teaching and assess literacy learning with EC-6 and 4-8 learners in a school setting. It includes the writing process, genres of children's literature and writing genres, evaluation of children's literature, teaching with mini-lessons using children's literature as mentor texts to teach writing, stages of writing in relation to early literacy, state and national standards for writing, high stakes writing tests and writing to learn. Prerequisites: READ 3311 and acceptance into the Teacher Education Program.

**READ 4310. Concepts of Literacy Classrooms. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of literacy initiatives and concepts for grades EC – 8. Prerequisites: Admission to the Tarleton Teacher Education Program and concurrent enrollment in EDUC 4315 or EDUC 4330.

**READ 4331. Assessment Field Implementation. 3 Credit Hours (Lecture: 1 Hour, Lab: 9 Hours).**
This course is designed to give students field-based experiences in the use of assessment to analyze students' strengths and needs, evaluate teacher effectiveness, and guide instructional planning for individuals and groups. The focus of this course will include the application of technology-based and traditional assessment models to enhance students' literacy achievement, including ELLs and students with special needs. Prerequisite: READ 3321. Admission to the Teacher Education Program.

**READ 4384. Literacy and Reading Problems Assessment for the Middle Years. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a field-based course surveying the characteristics of the middle to upper elementary learner and methods of assessment and instruction in all aspects of literacy including comprehension, vocabulary, and word identification in the context of state learning standards. The course also includes an examination of normal reading development, reading difficulties, including dyslexia, and strategies for assessing/addressing reading differences including diverse learner reading processes and development of literacy of English Language Learners. Prerequisite: READ 3311, Acceptance in the Teacher Education Program.

**READ 5086. Reading Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Directed study of selected problems in reading. Prerequisite: Approval of department head.

**READ 5197. Literacy Practicum I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course provides students with opportunities to apply content and use materials and strategies from READ 5375 Reading Assessment and Intervention in their own school setting. Concurrent enrollment in READ 5375 Reading Assessment and Intervention is required. Prerequisite: READ 5373 or 9 hours of undergraduate reading courses or approval of department head. Concurrent enrollment in READ 5375 Reading Assessment and Intervention is required.

**READ 5299. Literacy Practicum II. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course provides students with opportunities to apply content and use materials and strategies from READ 5376 Organization and Administration of Reading Programs in their own school setting. Concurrent enrollment in READ 5376 Organization and Administration of Reading Programs is required. Prerequisite: READ 5373 or 9 hours of undergraduate reading courses or approval of department head. Concurrent enrollment in READ 5376 Organization and Administration of Reading Programs is required.

**READ 5370. Literacy Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Models of the reading and writing processes. Includes characteristics of emergent, early, transitional and fluent literacy; instructional strategies in reading and writing; phonics instruction and strategies for teaching English language learners; the essential knowledge and skills in the language arts curriculum. Prerequisite: admission to the alternative teacher certification program at Tarleton.

**READ 5372. Language Arts for Today's Learner. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines research and strategies for implementing the reading/writing process in classrooms. Examines integrated curriculum, use of children's literature, classroom management and organization, evaluation, working with diverse learners, and developing support networks. Prerequisites: READ 5373 or 9 hours of undergraduate reading courses or approval of department head.

**READ 5373. Foundations of Reading. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines theoretical models of reading processes, historical perspectives on reading instruction, and their relationship to instructional practices. This course also focuses on instructional strategies and relationships between the components of reading: oral language, phonological and phonemic awareness, concepts of print, alphabetic principle, word identification, comprehension, vocabulary, and written language. Prerequisite: Elementary, secondary, or all-level certification or approval of department head.

**READ 5374. Reading Resources and Materials. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course researches, identifies, and evaluates a variety of print and non-print materials, including content area textbooks, trade books, and computer software. This course also focuses on development of comprehension through a variety of reading and writing strategies. Prerequisite: READ 5373 or 9 hours of undergraduate reading courses or approval of department head.

**READ 5375. Reading Assessment and Intervention. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines methods and techniques related to reading assessment and intervention for the components of reading. This course explores informal and formal reading assessment procedures, including the documentation and analysis of assessment data; using data analysis to design interventions for students with reading difficulties, dyslexia, and reading disabilities; and monitoring and evaluating the effectiveness of interventions. Concurrent enrollment in Literacy Practicum I is required. Prerequisites: READ 5373 or 9 hours of undergraduate reading courses or approval of department head. Concurrent enrollment in Literacy Practicum I is required.

**READ 5376. Organization and Administration of Reading Programs. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course surveys state and federal requirements, standards, trends, and issues related to the administration of reading programs. Students will examine instructional issues and reading programs for Pre-K through adult learners. Additional course topics include literacy instruction for English Language Learners, use of assessment results to plan instruction, flexible grouping strategies, textbook/test adoption procedures, roles and responsibilities of personnel in the reading programs, staff professional development, and facilitation of positive change strategies. Concurrent enrollment in Literacy Practicum II is required. Prerequisites: READ 5373 or 9 hours of undergraduate reading courses or approval of department head. Concurrent enrollment in Literacy Practicum II is required.

**READ 5377. Digital Literacy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Surveys digital technology, communication tools, and multiple forms of media to locate, evaluate, use, and create information in the 21st century reading classroom. Examines the appropriate use of technology paired with best practices to scaffold reading instruction for diverse populations. Prerequisites: READ 5373 or 9 hours of undergraduate reading courses or approval of department head.

**READ 5378. Adult Literacy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An analysis of theoretical and practical applications of adult literacy development. Topics will include a current and historical understanding of literacy, English Language Learners, adult technology literacy needs and skills, and future directions for adult education and literacy. Implications for program development and implementation of successful adult literacy programs will also be discussed. Prerequisite: READ 5373 or 9 hours of undergraduate reading or approval of department head.

**READ 5379. Advanced Psycholinguistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course emphasizes linguistic principles, the perception of language, the mental lexicon, sentence and discourse comprehension, the production of speech and language, conversational interaction, first and second language acquisition, biological foundations of language, and related topics, such as reading, linguistic diversity, and cultural influences. Credit for both READ 5379 and PSYC 5390 will not be awarded.

**READ 5380. Critical Literacy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course offers an introduction to the critical and analytical study of literature and its application to the modern classroom. Taking a critical perspective, students will examine the underlying messages in literature and explore topics of gender, race, power, and other complex social issues through multiple genres and texts. These topics will be situated in the context of literacy education.

# Real Estate

## Courses

**REST 4084. Internship. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-20 Hours).**
Preapproved and supervised work experience in a Real Estate related position with a public or private business organization. May be repeated for a total of 6 hours credit. Prerequisite: Approval of department head.

**REST 4086. Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A directed study of selected problems in Real Estate. May be repeated with approval of the head of the Department. Prerequisite: Approval of department head.

**REST 4090. Special Topics in Real Estate. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An examination of current topics in real estate. Readings required from current real estate publications and other related periodicals. May be repeated for credit when topics vary. Prerequisite: 9 hours of REST.

**REST 4303. Texas Real Estate Agency Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of agency concepts, basic agency relationships, disclosure and duties to client, disclosure and duties to third parties, creation and termination of the agency relationship, seller agency, subagency, buyer agency, representing more than one party in a transaction, dual agency, intermediary brokerage, single agency, clarifying agency relationships, employment issues, Deceptive Trade Practices and Consumer Protection Act, selected statutes and TREC rules, ethical and legal responsibilities.

**REST 4304. Principles of Real Estate I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of licensing as a real estate broker and salesperson, distinctions between real and personal property, the real estate market, concepts of home ownership, real estate brokerage and the law of agency, fair housing laws and ethical practices, Real Estate License Act, interests in real estate, how ownership is held, legal descriptions, encumbrances and liens.

**REST 4305. Principles of Real Estate II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of licensing as a real estate broker and salesperson, ethics of practice, titles to the conveyancing of real estate, legal descriptions, law of agency, deeds, encumbrances and liens, distinctions between personal and real property, contracts, appraisal, finance and regulations, closing procedures, and real estate mathematics.

**REST 4306. Texas Real Estate Contracts. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the Texas Real Estate License Act (TRELA) and the Rules of the Texas Real Estate Commission, the contract and other promulgated contracts and associated forms, obtaining a real estate loan, property descriptions, estimating seller net and buyer move-in.

**REST 4307. Real Estate Law. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of legal concepts of real estate, land description, real property rights and estates in land, contracts, conveyances, encumbrances, foreclosures, recording procedures, and evidence of titles.

**REST 4308. Real Estate Brokerage. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of real estate brokerage office, planning and organization, operational policies and procedures, law of agency, recruiting, selection and training of personnel records and control, real estate firm analysis and expansion criteria.

**REST 4309. Real Estate Appraisal. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the central purposes and functions of an appraisal, social and economic determinant of value, appraisal of case studies, cost, market data and income approaches to value estimates, final correlations, and reporting.

**REST 4385. Seminar in Real Estate. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of selected topics dealing with problems or unique needs of Real Estate. May be repeated for credit as topics vary. Prerequisite: Approval from department head.

# Range and Ranch Mmgmt

## Courses

**RNRM 3300. Rangeland and Forest Plants. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Comprehensive study of native and naturalized North American plants used for range, habitat, and wood products. Major domesticated pasture plants. Detailed treatment of systematics, nomenclature, morphological features, and ecology with emphasis on economically important range, lumber-pulp, and watershed species. Prerequisites: BIOL 1406. Lab fee $2.

**RNRM 3301. Principles of Range Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Principles and practices for managing native grazing lands. Use of the Cardinal Principles for conservation of range resources. Sustained forage, animal, water, etc., production and ranching profitability. Application of ecology and plant physiology to grazing management. Land-vegetation manipulations to restore deteriorated ranges and watersheds. Prerequisites: WSES 1305 or AGRI 1307, and either BIOL 1406 or BIOL 1407. Lab fee: $2.

**RNRM 3315. Range Ecology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Introduction of the physical and biological components of rangeland ecosystems and their influence on plant and animal growth. Field study of range ecosystems in the Cross Timbers area with emphasis on dynamics, interactions, and manipulation. Prerequisites: WSES 1305 or AGRI 1307, AGRI 1419, and RNRM 3300. Lab fee: $2.

**RNRM 3399. Cooperative Education. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 3-9 Hours).**
This course is designed to offer students the opportunity to integrate academic study with work experience that is germane to their major or minor. Enrollment requires a two-semester minimum commitment that may be accomplished by 1) alternating semesters of full-time study with semesters of curriculum-related employment, or 2) enrolling in courses at least half-time (6 semester hours) and working part-time in parallel positions of curriculum-related employment. The department Cooperative Education advisor will supervise the student's experience and assign the final grade based on the student's final report which is required to complete the course. Students may participate in the Cooperative Education program for an unlimited number of semesters but a maximum of 6 hours credit may be counted toward a degree. Prerequisites: Completion of 30 semester hours which includes 12 hours in the major or minor discipline in which the Cooperative Education course is desired, minimum overall GPA of 2.5 and a minimum GPA of 3.0 in the appropriate major or minor field, and department head approval.

**RNRM 4086. Problems in Range Management. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
Individualized or small group studies of current topics applicable to the management of rangeland with emphasis on the student's specific major and interests. Prerequisites: Senior classification and advance approval by instructor of record.

**RNRM 4088. Undergraduate Research. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
Fundamental research methods will be addressed through a faculty-directed project. Participation in an abbreviated lecture series may be required. Project components may include a literature review, data collection and analysis, testing, planning, project design, and/or computer modeling. The student is required to prepare a final report and produce a presentation. No credit is awarded until the the report and presentation are submitted. Only one undergraduate research experience will be counted toward degree requirements. Prerequisites: Junior Standing, completion of 12 hours in AGRN and/or RNRM, and approval of department head.

**RNRM 4090. Special Topics. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Special Topics. (Credit-variable) Deals with selected topics in agriculture or range management. May be repeated for credit when topics vary, with a maximum of six hours counting towards the degree. Prerequisite Course(s): Approval of department head.

**RNRM 4301. Perspectives and Practices in Grazing Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Concepts of management related to grazing livestock on improved pasture and rangeland. Grazing effects on the environmental system, manipulation of grazing selectivity and distribution, an overview of herbivore nutritive, grazing behavior and intake measures, and systems to manage for intensity or extensiveness of grazing. Credit will not be given for both RNRM 4301 and RNRM 5301. Prerequisites: RNRM 3301, and either WSES 1305 or AGRI 1307 and AGRI 1107.

**RNRM 4312. Range Improvement and Development. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Principles and practices associated with the development of rangelands for livestock and wildlife production. Study of grazing systems, facilities development, brush control, reseeding, fertilization, and burning to improve rangeland productivity. Prerequisite: RNRM 3301 or consent of instructor. Lab fee $2.

**RNRM 4384. Internship. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 1-3 Hours).**
An approved, supervised, comprehensive work experience consisting of a minimum of 240 hours (6 weeks) for career preparation in a public, commercial, or private range-related enterprise or ranching operation. Prerequisites: Senior or junior classification and approval of academic advisor and department head.

**RNRM 5086. Range Management Problems. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Advanced independent or group study of selected range management problems or topics. Credit hours dependent on scope and depth of study. Enrollment must be approved in advance by supervising instructor.

**RNRM 5301. Advanced Grazing Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Concepts of management related to grazing livestock on improved pasture and rangeland. Grazing effects on the environmental system, manipulation of grazing selectivity and distribution, an overview of herbivore nutritive, grazing behavior and intake measures, and systems to manage for intensity or extensiveness of grazing. Prior knowledge in range management and agronomic principles recommended. Credit will not be given for both RNRM 4301 and RNRM 5301.

**RNRM 5315. Rangeland Ecosystems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Specialized study of rangeland ecosystems with emphasis on herbivory as an ecological process. An in-depth review of assessment methodology, trends in research, and current ecological issues. Prerequisites: RNRM 3315 and graduate classification.

# Religion Studies

## Courses

**RELI 1301. Survey of the Old Testament. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the historical background and basic teachings of the Old Testament and its influence in the ancient world.

**RELI 1302. Survey of the New Testament. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of the historical background and basic teachings of the New Testament and its influence in the ancient world.

**RELI 3304. World Religions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of the philosophical, ethical, and social dimensions of the religions of the world. Focuses on major religions but lesser known ones may be included. The course will emphasize the diversity of religious experience and traditions. Credit for both PHIL 3304 and RELI 3304 will not be awarded.

**RELI 3309. History of Christianity and Christian Thought to the Reformation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An overview of the history of Christianity and Christian thought from founding to the beginnings of the Reformation with particular attention to major themes, movements, events, leaders, and developments within their social, cultural and political contexts. The course also offers an introduction to the central ideas and debates that have shaped the historical development of Christian theologies, practices, and institutions. Credit will not be awarded for more than one of the following courses: PHIL 3309, HIST 3309, and RELI 3309.

**RELI 4312. Religion and Politics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An examination of the major theories of the relationship of religion and politics and a survey of this relationship in the United States with a focus on religious liberty, church-state relations, and religious advocacy. Additional focus on Christian-majority states in Europe and the Americas and Muslim-majority states and the relationship of Islam and government, as well as critical contemporary issues. Students cannot receive credit for both POLS 4312 and RELI 4312. Prerequisites: GOVT 2305 and GOVT 2306.

# Sociology

## Courses

**SOCI 1301. Introductory Sociology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A general introduction to the concepts and elementary methods used in the study of society. Special attention is given to social organization, social stratification, social institutions, formal organizations, small groups, and social change.

**SOCI 1306. Social Problems. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A study of several major problems facing contemporary society in such areas as family, mental health, crime and juvenile delinquency, racial and ethnic relationships. Prerequisite: SOCI 1301.

**SOCI 2300. Hispanics in the United States. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The goal of the course is to introduce students to sociology while exploring Latin American societies. The course will start with a general presentation of both sociology and Latin America, followed by a discussion of what sociology is and the different ways of studying societies. The course will focus on Latin American studies and their particularities. The course will approach Latin America through the lens of politics, often from a comparative and historical perspective. Drawing on examples from various countries in Latin America, the course will examine the development of political structures, cultures, and practices in Latin America. Students will therefore be introduced to a range of important sociological issues. Relying on the historical background of different Latin American societies, students will explore sociological concepts such as race, gender, class, social violence, religion, sports, and culture. The course will examine the sociology of Latino people living in Texas and in the United States.

**SOCI 2303. Race and Ethnic Relations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course includes an analysis of relations between dominant groups and minority groups within the United States. Theories of prejudice and discrimination, the origins of the idea of race and ethnicity, the social historical foundations of the system of race and ethnic relations within the United States, systems of social stratification, and process of social change are emphasized. Credit for both SOCI 2303 and SOCW 3303 will not be awarded.

**SOCI 3301. Sociology of the Family. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A comparative study of the family as a social institution with emphasis on formation, functions, maintenance, child rearing, and family disorganization. Prerequisites: Junior classification and SOCI 1301 or approval of the department head.

**SOCI 3304. Medical Sociology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course explores how the sociology of health and illness are affected by social structure and cultural factors, including how these influence health and illness and people's perceptions of the same. Additionally, this course explores the concrete organizations that make up medical systems and how that system reflects the interests of doctors, insurance companies, pharmaceutical industries, hospitals, researchers, the government, and the consumer. Prerequisite: SOCI 1301 or approval of department head.

**SOCI 3305. Criminology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theories of criminology and significant research on causes, extent, cost and ecology of crime; police, criminal, and juvenile courts; and prisons and reformatories. Course also focuses on prevention and rehabilitation. Credit for both CRIJ 3305 and SOCI 3305 will not be awarded. Prerequisite: SOCI 1301 or approval of instructor.

**SOCI 3307. Rural Sociology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Adaptations of families to rural environments, farming, and other occupations; organizations, agencies, and institutions serving rural people; problems in delivering services to the country; and rural development and change. Prerequisites: Junior classification and SOCI 1301 or instructor approval.

**SOCI 3308. Deviant Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the factors and conditions leading to behaviors that violate and deviate from fundamental social values. The relationship of personal and social maladjustment is addressed in relation to the various theories of deviant behavior. Prerequisite: SOCI 1301.

**SOCI 3310. Sociology of Aging. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of the reciprocal relationship between society and those considered aged by society, utilizing concepts and theoretical frameworks applicable to that population group. The course also examines the social forces that impinge on the aging process, including socially constructed images of the aged, and patterns of inequality of gender, race, and economics. Credit for both SOCW 3310 and SOCI 3310 will not be awarded. Prerequisite: SOCI 1301.

**SOCI 3312. Environmental Sociology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines relationships and interactions between society and the environment. Also examines how the natural world and its degradation influence the way societies are organized by studying human communities as part of natural ecosystems. Prerequisite: SOCI 1301.

**SOCI 3315. Sociology of Sport and Leisure. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the mechanisms through which sport and leisure institutions and practices are created, maintained, and transformed. Particular attention is paid to the relationship between sport and leisure institutions and other social systems such as the family, religion, politics, and economics. Topics considered include violence, discrimination, power, globalization, and the role of the media. This course places a strong emphasis on exploring the ways in gender, race, and class intersect with sport and leisure institutions.

**SOCI 3320. Social Stratification and Inequality. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The study of social inequality in human society, with emphasis on the social class structure of the United States, its origins, development, and consequences for the society and the individual. Prerequisite: SOCI 1301 or approval of instructor.

**SOCI 3330. Social Science Statistics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Surveys the application of elementary forms of statistical processes, including central tendency, variation, the normal curve and Z scores, analysis of variance, regression analysis, and correlations, to social science data. The application of statistics will be made to the following areas: social work, sociology, criminal justice, political science, and gerontology. SPSS will be utilized for data analysis.

**SOCI 4085. Sociology Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Independent reading, research, discussion, and paper writing under personal direction of instructor. Prerequisite: Senior classification or approval of department head. May be taken more than once for credit if topics vary.

**SOCI 4086. Problems in Sociology. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Independent reading, research and discussion. Entry into this course will be arranged with the sociology counselor.

**SOCI 4302. Methods of Social Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Principles and methods of social research, including research design, methods of observation, questionnaires, interviews, and other sources of social data; qualitative and quantitative techniques of inference; analysis and research report writing. Limited research studies and projects will be undertaken by the students. Prerequisite: Junior classification, SOCI 1301, or approval of department head.

**SOCI 4303. Sociological Theory. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course examines the major schools of sociological thought, including perspectives from both classic and contemporary sociological theory. Prerequisites: Junior classification, SOCI 1301 or approval of department head.

**SOCI 4304. Sociology of Religion. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of the basic principles of religion, religious belief, and practice as a sociological concept. Attention will be given to the relationship of religion to the progress and stability of the social order. Prerequisite: SOCI 1301 or approval of department head.

**SOCI 4305. Social Psychology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The scientific study of the influence of society, groups, culture, and other persons on the attitudes, behavior, and experiences of the individual. An examination of the total person as he or she functions in relation to the social environment. Prerequisite: Junior classification, SOCI 1301, or approval of department head.

**SOCI 4306. Water Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course offers an interdisciplinary exploration on “water policies" -- that is, the political dimensions of human manipulation of water, wetlands and watersheds. While the substantive focus is water, the course is design to provide a broader introduction to social-scientific theorizing about human-environment relations. A central objective of the course will be examining Texas environmental laws regarding water policy; while employing a range of geographically diverse case studies that examine major topics on water politics, including: large-scale hydro-development and grassroots resistance thereto as a subset of the contentious history of international development policy more broadly the governance of common-pool resources; the emergence of participatory and community-based water management policies; the "neoliberalization" of water resources through privatization, marketization and commodification; and conflict and cooperation in the governance of trans-boundary waters. Our examination is guided analytically themes central to the environmental social sciences, including: power, institutions, political economy, and the social embeddedness of science. Credit for SOCI 4306, WSES 4306, and SOCI 5306 will not be awarded. Prerequisite: SOCI 1301.

**SOCI 4312. Gender in Society. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Socialization to sex roles; male/female differences in family, work, and political behavior; male/female inequality; effects of gender in education and religion; and current changes in sex role definitions. Prerequisite: SOCI 1301 and junior standing.

**SOCI 4313. Globalization. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on social processes and social problems as they are contained in the highly interdependent world system. Social change and development stresses historical, comparative, and critical perspectives, and addresses the problem of how and why societies and cultures around the world change and whether those changes promote justice, equity, democracy, and development of human potential. Prerequisites: Junior standing and SOCI 1301, or department head approval.

**SOCI 4314. Medical and Health Care Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Intensive study of current trends and issues related to professional health care practice, service delivery, and populations at risk. Provides an opportunity to explore the many ways in which issues related to health, illness, and disability policies including cultural factors impact clients, families, and society. Appropriate ways for health care professionals to understand and intervene in these areas will be discussed. Credit for both SOCI 4314 and SOCW 4314 will not be awarded.

**SOCI 4321. Death and Dying. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The ramifications of death, including the experiences and rights of the dying and the significance to those who mourn. Using major sociology theories, focuses on the meaning to society of the reality and symbolism of death. Credit for both SOCW 4321 and SOCI 4321 will not be awarded. Prerequisite: SOCI 1301.

**SOCI 4322. Age and Ethnic Stratification. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Studies aging as a process and life stage as affected by health, economic status, and stratification in this society and in other industrialized countries. Addresses culture, ethnicity, and race as key dimensions in understanding aging and health as delivered to diverse populations. Prerequisite: SOCI 3310.

**SOCI 4340. Sociology of Contemporary Japan. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course covers a wide range of topics regarding contemporary Japanese society, such as a brief history of contemporary Japan, family, workplace, gender, economics, politics, and popular culture. This course is intended to recognize multiple dimensions of Japan which go beyond the stereotypical image of Japan. Prerequisite: SOCI 1301 or ANTH 2351 or approval of instructor.

**SOCI 4341. Migration and Society. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The United States is a nation build on the backs of im/migrants. Millions of people leave their homelands escaping from religious/ political persecution, and/or extreme poverty with the hope of finding freedom and economic prosperity. The roles that immigrants play are very significant. Often they are praised for enriching the U.S. culture and for fueling economic growth. At the same time, they are condemned for burdening taxpayers and/or they are seen to be unwilling to assimilate in the host country. This course will address some of the key issues on international immigration to the United States. Prerequisites: SOCI 1301 or ANTH 2351 or approval of instructor.

**SOCI 4399. Sociology Internship/Capstone. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Serving as a required, capstone course, students assist the faculty supervisor with their placements in a social science related agency. The field experience, coupled with textbook materials and weekly class seminars, provides students the opportunity to integrate sociological theory with practical experience. At the agency, students will work 120 hours, acquiring professional skills while earning college credit. Students will also keep a journal of internship experiences and write a final paper that applies sociology to the field experience. Prerequisites: major in sociology, senior standing, and approval of the undergraduate advisor. Field experience fee $50.

**SOCI 5302. Methods of Social Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles and methods of social research, including research design, methods of observation, questionnaires, interviews, and other sources of social data; qualitative and quantitative techniques of inference; analysis and research report writing. Research studies and projects will be undertaken by the students appropriate for graduate level coursework.

**SOCI 5306. Water Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course offers an interdisciplinary exploration on “water policies" -- that is, the political dimensions of human manipulation of water, wetlands and watersheds. While the substantive focus is water, the course is design to provide a broader introduction to social-scientific theorizing about human-environment relations. A central objective of the course will be examining Texas environmental laws regarding water policy; while employing a range of geographically diverse case studies that examine major topics on water politics, including: large-scale hydro-development and grassroots resistance thereto as a subset of the contentious history of international development policy more broadly the governance of common-pool resources; the emergence of participatory and community-based water management policies; the "neoliberalization" of water resources through privatization, marketization and commodification; and conflict and cooperation in the governance of trans-boundary waters. Our examination is guided analytically themes central to the environmental social sciences, including: power, institutions, political economy, and the social embeddedness of science. Credit for SOCI 4306, WSES 4306, and SOCI 5306 will not be awarded.

**SOCI 5312. Environmental Sociology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines relationships and interactions between society and the environment. Also examines how the natural world and its degradation influence the way societies are organized by studying human communities as part of natural ecosystems.

**SOCI 5386. Problems in Sociology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Independent reading, research, and discussion under the supervision of an instructor. May be repeated as topic varies for up to six hours of credit.

**SOCI 5390. Special Topics in Sociology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Selected topics in an identified area of sociology. May be repeated as topics vary.

# Soil Science

## Courses

**SOIL 2112. Soil Morphology. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Soil morphology, characterizations of soil, and judging of soils for various uses by field-based assessment. May receive credit for WSES 2112 or SOIL 2112.

**SOIL 2375. Soil as the Basis for Society. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The underpinnings of the scientific principles of soils, how people have harmed them, and why everyone should be concerned with how we treat them. This course may not be used to fulfill the degree requirements for wildlife or ecosystem sciences.

**SOIL 3101. Soil Science Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 4 Hours).**
Basic laboratory techniques used to analyze soil chemical, physical, and biological properties. Hands on examples will demonstrate core soil science principles. Prerequisites: ENVS 3301 or SOIL 3301 (or concurrent enrollment); and CHEM 1411, CHEM 1407, or CHEM 1409.

**SOIL 3301. Soil Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Basic principles of soil science, including physical, biological, and chemical properties. Discussion will include soils applications in wildland, cropland, and developed environments. This course does not include a laboratory section. Credit will not be awarded for both this course and WSES 3401. Prerequisite: CHEM 1411, CHEM 1407, or CHEM 1409.

**SOIL 3302. Soils, Land Use, and The Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will examine the interactions among soil physical, chemical, and biological process affecting soil, water, and environmental quality. These interactions will be addressed in relation to land use management practices such as erosion control, soil conservation, soil reclamation, riparian buffers, bioswales, and artificial wetlands. Throughout the course, land use planning tools, including WebSoil Survey and GIS will be used. Prerequisites: WSES/ENVS/SOIL 3401, WSES/ENVS/SOIL 3301, or WSES/ENVS/SOIL 2375 and consent of the instructor.

**SOIL 3319. Composting. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The art and science of composting of agricultural, municipal, foodservice and household wastes to include composting techniques, waste products and feedstocks, aerobic vs. anaerobic processes, evaluation of composted products and their beneficial uses. Biological processes used to decompose organic materials will be studied. Prerequisites: Junior standing or permission of the instructor.

**SOIL 3412. Soil Genesis, Morphology, and Classification. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Soil development, classification, and mapping. Laboratory work will consist of field study of the morphological features of the soil profile and the mapping of designated areas using standardized methods. Student may receive credit for either WSES 3412 or SOIL 3412. Prerequisites: WSES 3401 or SOIL 3301 and SOIL 3101.

**SOIL 4212. Soil Ecology. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Characterizations of organisms in the soil food web, analyses of interrelationships among soil organisms, and assessments of interactions between soil organisms and their environmental conditions. Credit will only be given for WSES 4212 or SOIL 4212. Prerequisites: WSES 2405 and WSES 3401 or SOIL 3301 and SOIL 3101.

**SOIL 4213. Soil Physical Properties. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Soil physical characteristics and their relationship to soil management. Methods of measuring soil and soil conservation. Soil phases, soil water properties, particle size, clay and clay mineralogy, and environmental impacts. Credit will only be given for WSES 4213 or SOIL 4213. Prerequisites: WSES 3401 or SOIL 3301 and SOIL 3101.

**SOIL 4450. Soil Nutrient Cycling. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Plant nutrition, soil nutrient cycling, and nutrient management. Soil biological, physical, and chemical properties and interactions with nutrient availability to crops and nutrient fate in the environment. Plant nutrition/soil fertility problems and corrective action, soil and nutrient management. Credit will only be given for WSES 4450 or SOIL 4450. Prerequisites: WSES 3401 or SOIL 3301 and SOIL 3101.

# Spanish

## Courses

**SPAN 1100. Transitioning to University Studies in Spanish. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to introduce Spanish majors to university life and to the career possibilities available for these majors. Students will develop skills for academic success, development of personal growth and responsibility, and will engage in active involvement in the learning process from an individual college perspective.

**SPAN 1303. Basic Spanish for Vocations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Instruction and practice in understanding and speaking basic colloquial Spanish encountered in a particular occupational context such as farming, ranching, or law enforcement. May be taken for elective credit and may also satisfy specified program requirements.

**SPAN 1411. Beginning Spanish I. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Introduction to the Spanish language for communication on a basic level. Applies the four-skills approach of reading, writing, listening, and speaking. Integrated classroom instruction and electronic language lab. Lab fee $5.

**SPAN 1412. Beginning Spanish II. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Continuation of four-skills introduction to the Spanish language for communication on a basic level. Integrated classroom instruction and electronic language lab. Prerequisite: SPAN 1411 or equivalent as approved by department head. Lab fee $5.

**SPAN 2311. Intermediate Spanish I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Review of basic language structure. Oral and written expression on an intermediate level. Prerequisite: SPAN 1412.

**SPAN 2312. Intermediate Spanish II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Intensive review of language and structure with continued practice in oral and written expression on an intermediate level. Prerequisite: SPAN 2311.

**SPAN 3301. Oral Proficiency in Spanish. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Discussions of relevant cultural and social issues in Spanish, with increased emphasis on understanding native Spanish and responding to it. Either SPAN 3301 or SPAN 3302 will be counted toward degree, not both. Prerequisites: SPAN 2312 or equivalent and approval of program coordinator.

**SPAN 3302. Spanish for Heritage or Native Speakers. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Study of writing skills for heritage or native speakers, addressing spelling, structure, and the differentiation of colloquial Spanish from formal or standard Spanish. Either SPAN 3301 or SPAN 3302 will be counted toward degree, not both. Prerequisites: SPAN 2312 or equivalent and approval of program coordinator.

**SPAN 3303. Spanish Grammar for Composition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Development of writing skills in Spanish and analysis of key elements of Spanish grammar as a tool for efficient writing. Prerequisite: SPAN 2312.

**SPAN 4086. Spanish Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours).**
A course featuring independent reading, research, and discussion under personal direction of the instructor. Topics vary according to student needs. Prerequisite: SPAN 3303 and 3306 and approval of department head.

**SPAN 4300. Foundation in Literary Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Introduction to the study of Hispanic Literature and to the study of narrative, poetic and dramatic genres. Overview of literary movements in Spanish and Latin American Literature and to textual commentary and analysis. Prerequisite: SPAN 3301 or SPAN 3302 and SPAN 3303; or approval of instructor.

**SPAN 4301. Survey of Peninsular LIterature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An overview of the literature and literary movements of Spain. Commentary and analysis of Spanish texts from the "Poema del Mio Cid" to the 20th century.

**SPAN 4302. Survey of Spanish-America Literature. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
An overview of the literature and literary movements of Spanish America. Commentary and analysis of Spanish American texts from the chronicles of the conquistadors to the 20th century. Pre-requisite: SPAN 4300 or approval of instructor.

**SPAN 4303. Chicano Literature in Spanish. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course studies Chicano literature written in Spanish. Through the study of the literary production of several Chicano writers we will study the linguistic characteristics of the Chicano variation of Spanish, as well as the problematic of the Chicano population, issues of cultural identity, social justice and sexual politics. Prerequisites: SPAN 4300.

**SPAN 4304. The Caribbean Experience. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course studies the Hispanic Caribbean: Cuba, The Dominican Republic and Puerto Rico, in its many cultural dimensions. We will survey the historic background of these three Caribbean islands and study a sample of their literary production. Prerequisites: SPAN 4300.

**SPAN 4305. Modernismo. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course studies Spanish American Modernismo as a literary generation and as a product of the end of the nineteenth century. Included in the study will be poetry, fiction, and essays from various Modernista writers. Prerequisites: SPAN 4300.

**SPAN 4306. Culture and Civilization of Spain and Latin America. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An historical and cultural overview of Spain and Latin America. Major historical events and manifestations that have shaped the Spanish and Latin American culture and civilizations are studied. This course is an introduction to the cultural, historical, and sociopolitical realities of Spain and Latin America. Prerequisites: SPAN 3303 and either SPAN 3301 or SPAN 3302; or approval of instructor or department head.

**SPAN 4307. Advanced Oral and Writing Skills. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course provides practice of both speaking and writing in the Spanish language, building on the skills acquired in SPAN 3303 and 3306. The language functions will be practiced at the advanced level required for the Texas Oral Proficiency Test (TOPT). Prerequisites: SPAN 3303 and either SPAN 3301 or SPAN 3302.

**SPAN 4308. The Short Latin American Novel. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course studies some important short Latin American novels, with a main focus in the 20th century. To have a better understanding of these narratives, the historical background of some Latin American countries during this time period will be discussed. Prerequisite: 4300 or approval of instructor.

**SPAN 4309. Spanish Language Pedagogy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The course provides a theoretical background on the currents methods of teaching Spanish as a second language. The course presents the basic concepts of second language acquisition. Prerequisite: SPAN 4307.

# Social Work

## Courses

**SOCW 1100. Transitioning to University Studies in Social Work. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, and in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process from an individual college perspective. Also included will be the development of skills in the learning process from a Department of Social Work perspective.

**SOCW 2361. Introduction to Social Work. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An overview of the history and development of social work as a profession. The course is designed to foster a philosophical, historical, and critical understanding of the social work profession including social work values, ethics, and areas of practice utilized under a Generalist Social Work Model.

**SOCW 2362. Social Welfare in America. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course offers a historical and contemporary examination of legislation and resulting programs, policies, and services in the context of the social welfare system in the United States. Special attention is given to the political, economic, environmental, and social conditions that prompted the development of legislation to meet the needs of vulnerable populations. Societal responses to legislation are also considered.

**SOCW 2389. Academic Cooperative. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An experiential learning course designed to integrate program study with introductory exposure to the field of social work. Prerequisite: SOCW 2361.

**SOCW 3300. Methods and Skills of Interviewing. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This pre-professional course will introduce students to the Generalist Social Work Practice Model. Beginning social work skills introduced include the principles of conducting the helping interview, including initial client contact, attending and listening, empathetic responses, exploration and elaboration, questioning, gaining cooperation, self-disclosure, and termination on the micro, mezzo, and macro practice levels. Issues of problem-solving with diverse populations and persons from different cultural backgrounds as well as ethical issues of helping relationships are explored. Prerequisite: Completion of or concurrent enrollment in SOCW 2361 with a grade of "C" or higher.

**SOCW 3303. Social Work with Diverse Populations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will familiarize the student with the cultural roots of the diverse ethnic groups that make up American society, tracing the process of acculturation that characterizes their American experience.

**SOCW 3306. Social Welfare Policy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course helps students gain the knowledge and skills necessary to effectively advocate for policy changes that promote social justice and to analyze policy to determine its effect on client populations and agency programs and services. Prerequisite: Completion of SOCW 2362 with a C or higher.

**SOCW 3310. Social Work with Aging Populations. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will use a competency-based approach to preparing students to engage in social work practice with aging populations. The focus will be on the four domains of geriatric competencies adopted by the Hartford Geriatric Social Work Initiative. The four domains are: 1) values, ethics, and theoretical perspectives; 2) assessment; 3) intervention; 4) aging services, programs, and policies. Prerequisite: Junior classification.

**SOCW 3311. Social Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Uses major theoretical perspectives from sociology to explore causes and consequences of contemporary social issues in American society such as alienation, family stresses, poverty, unemployment and technological change.

**SOCW 3314. Methods of Social Work Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Principles of the scientific method for building knowledge of and evaluating practice. Topics include: ethical and cultural issues in research; research design and methodology; quantitative and qualitative research strategies; evaluation of practice; critical evaluation of published research; and completion and reporting of research projects. Prerequisites: Completion of SOCW 3320 & SOCW 3306 with a grade of C or higher.

**SOCW 3316. Practice I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focus is on theories and methodologies needed for generalist social work practice with individuals and small groups. Critical evaluation of the value base of the social work profession and basic practice concepts for understanding a variety of intevention models in diverse settings will be explored. Prerequisite: Admission to the Social Work Program and completion of SOCW 3300 with a grade of “C” or higher, and concurrent enrollment or completion of SOCW 3329 with a grade of "C" or higher.

**SOCW 3320. Service Learning. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 4-12 Hours).**
Each student will identify and respond to a community/neighborhood challenge through volunteer, service learning work with a non-profit community agency and/ or under direct supervision of the instructor. Volunteer work may be accomplished I the student’s home neighborhood or community. Students will engage in supervised individual hours of service activities and have the opportunity to reflect on the responses to those problems. Prerequisites: SOCW 2362 or SOCW 2361.

**SOCW 3329. Human Behavior and Social Environment I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will provide students with an opportunity to explore issues related to the person in environment. Emphasis will be placed on the process of human development from prenatal development to adolescence and on the environment surrounding individuals and families. Students will become familiar with the normal range of biological, psychological, and social development throughout the lifespan and will consider the effects the environment has on individual development. Students will learn how to conduct comprehensive bio-psycho-social spiritual assessments using a strengths and systems perspective. Prerequisite: Completion of SOCW 2361, SOCW 2362, SOCW 2389; completion of or concurrent enrollment in SOCW 3300, SOCI 1306.

**SOCW 3339. Human Behavior and Social Environment II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a continuation of Human Behavior and the Social Environment I with an emphasis on theories and knowledge about human functioning from adolescence through the end of life. Using an ecological/systems, developmental, and strengths framework, this course provides an integrated look at the bio-psycho-social spiritual factors influencing human development. Students will be exposed to theories and knowledge for practice across all system levels (individual, family, group, community, and society) of generalist practice. Values and ethical issues are included. Prerequisite: Completion of SOCW 3329 with a C or higher.

**SOCW 3377. Alcohol and Drug Abuse. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focus on psychoactive substances of use and abuse including: alcohol, legal/illegal drugs, and their impact on individuals, families, and society. Models of addiction, society's attitudes, and services for persons and families are explored.

**SOCW 4059. International Social Work. 3-6 Credit Hours (Lecture: 3-6 Hours, Lab: 0 Hours).**
Provides students with an understanding of social work practice and social welfare policies from an international perspective. The implications of globalization and its impact on social welfare policies and social work practice will be examined. Strategies for inter-cultural social work practice and methods of combating discrimination also will be examined. Students may have the opportunity to travel outside the U.S. in order to become familiar with social welfare policies and programs from an international perspective.

**SOCW 4085. Social Work Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
Intensive studies of current trends and issues related to professional social work practice, social service delivery, and populations at risk. May repeated for credit when topics vary. Prerequisite: Junior classification or approval of the Social Work Program Director.

**SOCW 4086. Problems in Social Work. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Independent reading and research on various social work-related topics. Entry into the course will be arranged by the faculty member with approval from the Department Head if needed.

**SOCW 4311. Child Welfare. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the practice of social work in a child welfare context. This course is designed to introduce students to a variety of social work practice settings in child welfare. Past and present child welfare policies and programs will be examined.

**SOCW 4312. Practice II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Focus is on integrating theoretical concepts and frameworks with the practice of social change at community, society, and global levels. Models of community organization--community development, social action, and social planning will be emphasized including methods of resource delivery and redistribution. Prerequisites: Student must be admitted to the Social Work Program. SOCW 3300, SOCW 3320, SOCW 3329, and SOCW 3316 with a grade of C or higher.

**SOCW 4313. Human Rights. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Using the United Nations Declaration on Human Rights as a foundation, this course examines human rights and human rights violations using a global perspective.

**SOCW 4315. Social Work Values and Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The focus of this course is to encourage and assist students in the development of an ethical framework for social work practice. This framework requires students to develop a better understanding of and the ability to manage the ethical issues and dilemmas they will encounter in social work practice. The course integrates concepts related to social values and ethics, diversity, promotion of social and economic justice, and empowerment of human beings. Additionally, the course allows students to apply the NASW Code of Ethics and the Code of Ethics of the Texas State Conduct of Social Work Examiners to multi-faceted ethical dilemmas.

**SOCW 4318. Adoptions & Custody. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The focus of this course is on understanding the family court processes of adoption and child custody and the social worker/ mental health professional’s role in these processes. Students will obtain the assessment and writing skills to complete reports for family court.

**SOCW 4321. Death and Dying. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The ramifications of death, including the experiences and rights of the dying and the significance to those who mourn. Using major sociology theories, focuses on the meaning to society of the reality and symbolism of death. Credit for both SOCW 4321 and SOCI 4321 will not be awarded. Prerequisite: SOCI 1301.

**SOCW 4324. Trauma & DeBriefing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines a practical approach to understanding trauma and provides empowering interventions to apply to practice with childhood and adult survivors of physical, sexual and other forms of abuse and trauma.

**SOCW 4342. Disaster & Response. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The purpose of this class is to prepare social workers, and other helping professionals to understand the emergency management systems and to respond with a defined skill set that offers emotional support for persons during disaster incidents. It will also train participants in how to partner with public health, emergency management, hospitals, police, fire, and EMS agencies. Students will be trained to integrate with response partners during major disaster emergencies such as mass causality/fatality incidents, natural disasters, and the outbreaks of epidemic and pandemic diseases, where there was a need for psychosocial support.

**SOCW 4352. Women's Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Examines the role of women from a global perspective. Focuses on specific issues that affect the everyday lives of women. Special attention is given to the differential and unequal treatment of women based on age, race, social class, and cultural differences.

**SOCW 4622. Field Placement I. 6 Credit Hours (Lecture: 3 Hours, Lab: 16 Hours).**
This course is designed to provide application and integration of academic learning and development of skills within a field setting. Placement is arranged with social work faculty. A seminar is scheduled along with agency placement. At Tarleton, approximately 16 hours a week for 14 weeks of the semester is the requirement. This total will culminate in a total of 225 hours per semester. Prerequisites: Acceptance into the field program and completion of SOCW 2362, 3316, 3320 and 3339.

**SOCW 4623. Field Placement II. 6 Credit Hours (Lecture: 3 Hours, Lab: 16 Hours).**
This course requires the application and integration of academic learning and development of skills within a field setting. Placement is arranged with social work field faculty. A seminar is scheduled along with agency placement. A total of 450 hours (225 each semester) is required in the field agency. Prerequisite: Completion of SOCW 4622 with a grade of "C" or higher.

**SOCW 4632. Child Welfare Practicum. 12 Credit Hours (Lecture: 3 Hours, Lab: 27 Hours).**
A practicum limited to students in the Title IV-E Child Welfare Program. Provides students with an opportunity to integrate theory and develop practice skills in a child welfare setting. Requires a minimum of 450 hours be completed in a professionally supervised State of Texas Child Protective Services setting. Prerequisites: Acceptance to the Title IV-E Child Welfare Program, completion of all required social work courses.

**SOCW 5059. International Social Work. 3-6 Credit Hours (Lecture: 3-6 Hours, Lab: 0 Hours).**
Provides students with an understanding of social work practice and social welfare policies from an international perspective. The implications of globalization and its impact on social welfare policies and social work practice will be examined. Strategies for inter-cultural social work practice and methods of combating discrimination also will be examined. Students may have the opportunity to travel outside the U.S. in order to become familiar with social welfare policies and programs from an international perspective. Course is repeatable if focus of course or travel is different.

**SOCW 5086. Problems in Social Work. 6 Credit Hours (Lecture: 6 Hours, Lab: 0 Hours).**
Independent reading and research on various social work-related topics. Entry into the course will be arranged by Social Work Program Director.

**SOCW 5101. Foundation Integrative Seminar I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This is the first of a two semester seminar designed to facilitate student integration of foundation social work practice and theory while strengthening partnerships in the community. Course content will revolve around specific agency-based practice situations and curriculum integrative themes in keeping with the University's mission of working with both private and public, local and state agencies. Prerequisite: SOCW 5320 and must take concurrent with SOCW 5322.

**SOCW 5102. Foundation Integrative Seminar II. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This is the second of a two semester seminar designed to facilitate student integration of foundation social work practice and theory while strengthening partnerships in the community. Course content will revolve around specific agency-based practice situations and curriculum integrative themes in keeping with the University's mission of working with both private and public, local and state agencies. Prerequisite: SOCW 5101 and taken concurrently with SOCW 5323.

**SOCW 5104. Integrative Clinical Seminar I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This two semester seminar (SOCW 5104 & 5105) is designed to facilitate student integration of clinical social work practice and theory while strengthening partnerships in the community. Course content will revolve around specific agency-based practice situations and curriculum integrative themes in keeping with the University's mission of working with both private and public, local and state agencies.

**SOCW 5105. Integrative Clinical Seminar II. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This two semester seminar (SOCW 5104 & 5105) is designed to facilitate student integration of clinical social work practice and theory while strengthening partnerships in the community. Course content will revolve around specific agency-based practice situations and curriculum integrative themes in keeping with the University's mission of working with both private and public, local and state agencies. Prerequisite: Completion of SOCW 5104 with a "B" or higher.

**SOCW 5305. Foundations of Community & Organization Practice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides a review of community organization theory and practice at both the macro and micro levels. Basic models of community organization theory and practice are highlighted, including locality development, social planning, and social action as well as major policy issues that relate to communities. Special attention is given to the historical base of community organization in America, citizen/consumer participation, volunteerism, assessment of community needs, impact of racism, and community work and intervention techniques. Students will examine the range of social work roles and functioning in community organization practice from the personal individual participant perspective to the social worker/ professional organizer perspective, and as a policy-maker.

**SOCW 5310. Direct Practice – Individuals, Families, & Groups. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Theory for social work practice is studied, using an integrated social systems and biopsychosocial-spiritual model. The student is introduced to the profession through its history, its conceptual development and through an examination of the values, knowledge and skills which characterize it. The course content focuses on the worker/client relationship and development of assessment, intervention and evaluation skills used in interventions with individual clients, families, and small groups. Appropriate worker intervention in individualized treatment planning and implementation and the dynamics of small group process are also examined.

**SOCW 5315. Social Policy & Policy Analysis. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Foundation course on social policy, policy practice and practice in communities and organizations. Surveys historical evolution of social welfare policy and contemporary provision of social welfare services, including the role of values in policy formulation and principles of social and economic justice. Introduces the social work role as change agent in legislative, community and organizational arenas.

**SOCW 5321. Foundations of Social Work. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides students a foundation in social work practice, including social work roles, functions, and tasks that social workers perform across settings. The course will also introduce social work values and ethics, theories, the generalist intervention model (GIM), diversity and inclusion, and licensing issues.

**SOCW 5322. Foundation Field Placement I. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
This course the first foundation field course designed to provide application and integration of academic learning and development of skills within a field setting. Placement is arranged with the MSW Field Director prior to the beginning of the spring semester. A weekly integrative seminar is scheduled along with an agency placement. The total number of hours performed by the end of the semester for this foundation field course is 200 hours, completed over 15 weeks of field setting placement. The total number of hours for the graduate foundation field placement required by the Council on Social Work Education (CSWE) is 400 hours; this first course covers the first 200 of those required hours. Prerequisites: SOCW 5320 and must take concurrently with SOCW 5101.

**SOCW 5323. Foundation Field Placement II. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
This course the second foundation field course designed to provide application and integration of academic learning and development of skills within a field setting. Placement is arranged with the MSW Field Director prior to the beginning of the spring semester. A weekly integrative seminar is scheduled along with an agency placement. The total number of hours performed by the end of the semester for this foundation field course is 200 hours, completed over 15 weeks of field setting placement. The total number of hours for the graduate foundation field placement required by the Council on Social Work Education (CSWE) is 400 hours; this second course covers the final 200 of those required hours. Prerequisites: SOCW 5322 and must take concurrently with SOCW 5102.

**SOCW 5325. Research I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on foundation content in research design and methodology that can be used by social work practitioners to evaluate their individual practice, evaluate social programs, and advance practice knowledge. The major goals of the course are to enable students to develop a scientific perspective, to acquire an understanding of different research viewpoints that can be used to evaluate practice, and to incorporate that perspective and understanding into a broader conceptual base for social work practice. The course aids students in thinking critically about the methods and limitations of various systems of inquiry, and about society, people, and their problems.

**SOCW 5330. Human Behavior in the Social Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the life cycle of the individual from in utero through old age and death from a biopsychosocial-spiritual perspective via multiple theoretical frameworks. Individual growth and development is studied in the context of culture, race, ethnicity, social class, gender, families and other social systems. Attention is also given to the impact of trauma, loss, and environmental stressors on the individual and the family.

**SOCW 5340. Social Justice & Disparities. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will introduce students to the importance of operating from a lens of equity by familiarizing students with culture and diversity within and between groups. Students will learn and apply an integral framework of equity using generalist practice skills at the micro, mezzo, and macro level to address social justice and disparity issues in society. Various diverse areas of age, gender, sexual orientation, race, religion, spirituality, physical and mental ability are explored with specific attention to the historical aspects of oppression and discrimination of each area. Students will also engage in critical self-exploration and self-awareness as it relates to each of the diverse areas taught in this course to advance his/her own self-identity.

**SOCW 5341. Perspectives on Loss & Grief. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Perspectives on Loss and Grief acquaints students with the issues surrounding loss and grief. Theoretical foundations will be explored as related to death and dying, but also other types of loss including divorce, adoption and foster care, symbolic loss, etc. Students will explore various counseling techniques, and will learn about developmental issues that impact grief reactions.

**SOCW 5360. Administrative & Leadership Practice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course teaches theories and strategies for effective leadership in organizations and communities. The course examines strategies to combat marginalization and institutional oppression, as well as those that promote social and economic justice in organizations and community environments. Students will develop leadership skills in a variety of settings in both formal and informal capacities. Prerequisites: All Foundation courses or Admission to Advanced Standing Program.

**SOCW 5362. Multicultural Practice Field Placement I. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
This course the first clinical field course designed to provide application and integration of academic learning and development of skills within a field setting. Placement is arranged with the MSW Field Director prior to the beginning of the academic year. A weekly integrative seminar is scheduled along with an agency placement. The total number of hours performed by the end of the semester for this clinical field course is 250 hours, completed over 15 weeks of field setting placement. The total number of hours for the graduate clinical field placement required by the Council on Social Work Education (CSWE) is 500 hours; this first course covers the first 250 of those required hours.

**SOCW 5363. Multicultural Practice Field Placement II. 3 Credit Hours (Lecture: 0 Hours, Lab: 3 Hours).**
This course the second clinical field course designed to provide application and integration of academic learning and development of skills within a field setting. Placement is arranged with the MSW Field Director prior to the beginning of the academic year. A weekly integrative seminar is scheduled along with an agency placement. The total number of hours performed by the end of the semester for this clinical field course is 250 hours, completed over 15 weeks of field setting placement. The total number of hours for the graduate clinical field placement required by the Council on Social Work Education (CSWE) is 500 hours; this second course covers the last 250 of those required hours. Prerequisite: Completion of SOCW 5362 with a "B" or higher.

**SOCW 5365. Community Organizing & Engagement. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the challenges and benefits of constructively engaging diverse community groups toward a solution that encompasses the voices of relevant stakeholders. The course proposes that working toward social and economic justice means addressing root causes of social issues, such as poverty, and working to end oppression, rather than creating mechanisms that institutionalize marginalization. Students learn how to build communities by enhancing their capacity to solve problems and implement solutions through strategic partnerships that engage stakeholders in meaningful partnerships, mutual learning, shared responsibility, and collective action. Prerequisite: All Foundation courses or Admission to Advanced Standing Program.

**SOCW 5370. Community & Evaluation Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course focuses on the ability to use research to address community and organizational problems. Both quantitative and qualitative methods will be taught and students will learn to develop community plans, develop programs, and submit grants based on research findings. The course includes content in advanced research design, implementation, methodology, and data analysis. The course will also explore time studies and policy research. Student will prepare a research proposal to be implemented in the Research Practicum. Prerequisite:.

**SOCW 5371. Advanced Multicultural Practice I. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will expand student's knowledge of critical analysis and holistic application of clinical practice skills building from the foundation level practice-based courses, specifically when working with individuals. Through the use of evidence based theoretical models students will learn how to integrate the knowledge of culture in practice and effectively implement interventions when working with diverse populations who have historically experienced discrimination and oppression. Various historical and current cultural perspectives are provided to enhance student's personal and professional awareness and critical holistic application of multicultural practice. Holistic refers to capturing a biological, cultural, psychological, social, and spiritual framework.

**SOCW 5372. Advanced Multicultural Practice II. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will expand student's knowledge of critical analysis and holistic application of clinical practice skills building from the foundation level practice-based courses, specifically when working with families. Through the use of evidence based theoretical models students will learn how to integrate the knowledge of culture in practice and effectively implement interventions when working with families. Various historical and current cultural perspectives are provided to enhance student's personal and professional awareness and critical holistic application of multicultural practice with families.

**SOCW 5373. DSM for Clinicians. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course introduces students to various diagnostic codes of emotional and mental disorders categorized in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5 or the latest version) often experienced by individuals and families to help build students' knowledge about mental illness and its role in advanced social work practice. Through the use of various assessment tools, students will learn how to utilize assessments as part of the process for interventions with children and families. The pathology of persons suffering from the most common disorders is also explored with specific emphasis on documentation skills of assessment, interviewing, and treatment planning of clinical social workers.

**SOCW 5374. Advanced Clinical Research. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course builds on SOCW 5325 Research foundation course and delves into an in depth research process of quantitative and qualitative evaluation of clinical practice. Primary areas of focus include integrating research skills related to single subject research design, data collection, data analysis, measurement, and reporting. Practice informed research and research informed practice application is emphasized along with assessing student's critical consciousness and scholarly application of standardized and self-constructed measurement instruments as it relates to various modes of micro and mezzo practice.

**SOCW 5375. Grant Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to provide students with knowledge and skills in program development, proposal writing and grant development. Prerequisite: All Foundation courses or Admission to Advanced Standing Program.

**SOCW 5376. Program Development/Intro to Grant Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides Advanced MSW students with the knowledge and skills to develop social service programs within existing agencies, with an emphasis on programs to serve vulnerable populations. Students will be introduced to grant writing, including how to search for grants and the basic foundations of writing a grant. Students will be introduced to Logic Models.

**SOCW 5380. Advanced Community Practice. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course teaches advanced skills in community organizing and organizational leadership as well as advanced skills in policy analysis and development. Students will practice advanced macro skills in the class using model organizations and community situations. Students will learn how to engage diverse populations in the communities and in organizations. Further, students will use their findings from the research performed in the Research Practicum to develop proposals, recommendations, and policy briefs so that they can understand how research is utilized to make positive changes in organizations and communities as well as promoting social and economic justice through policy change. This course will incorporate advanced theories of community, organizational theories, and policy analysis frameworks. Prerequisite: SOCW 5365 and Must be taken concurrently with SOCW 5385.

**SOCW 5381. Clinical Supervision. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course facilitates the student's exploration of supervision as both supervisee and supervisor. Students will be taught supervision and management theories including organizational and classical theories of management and application. Different models of supervision techniques and styles of supervision will be integrated into the learning process for students along with the ethical and legal issues associated with supervision.

**SOCW 5385. Research Practicum. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is the second part of SOCW 5370 Community & Evaluation Research. Students will use the proposal developed in that course to implement their research plan, analyze results, and develop recommendations and program/ grant ideas based on the research findings. This course focuses on the ability to use research to address community and organizational problems and the research will be conducted in the community and a professional presentation of results is expected in a community venue. Students will learn to write up results using scientific language. Students will also be encouraged to consider writing for publication and/ or presenting findings at professional conferences. Prerequisite: All Foundation courses or Admission to Advanced Standing Program and completion of SOCW 5370.

**SOCW 5386. Group Work. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course builds on the foundational courses of practice skills and relates those skills to group work, group development, and group types (psychoeducational, support, task-oriented, therapeutic). Students will learn and apply the facilitation of groups in various agency and community based settings with culturally diverse groups and situations. The course will also provide additional knowledge about assessment of group dynamics to assist students in determining appropriate intervention skills within groups.

**SOCW 5390. Special Topics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An examination of different topics each semester with a focus on contemporary issues in Social Work. This course may be repeated for credit as the topic changes.

# Early Childhood Education

## Courses

**TECA 1311. Introduction to Early Childhood Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
(TCCNS = TECA 1311) An introduction to the profession of early childhood education, focusing on developmentally appropriate practices, types of programs, historical perspectives, ethics, and current issues. One-hour lab per week in child development laboratory, to include directed observation of young children and teaching experiences.

**TECA 1318. Wellness of the Young Child. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
(TCCNS = TECA 1318) A study of nutrition, health, and safety for the child. Skill development in management of issues, guidelines, and practices in nutrition, as well as community health, hygiene, safety, and legal implications will be addressed. Integration of these principles applied to a variety of settings.

**TECA 1354. Child Growth and Development. 3 Credit Hours (Lecture: 3 Hours, Lab: 1 Hour).**
(TCCNS = TECA 1354) Emphasis is on the child from conception through younger years with a study of growth and development in the family setting. Directed observation in approved settings is required.

# University Studies

## Courses

**UNIV 0204. Non-Course Based Option for MATH 0304. 2 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Non-course based option to support students enrolled in the Fundamentals of Algebra class. This class presents a study of relations and functions inequalities, algebraic expressions and equations (absolute value, polynomial, radical, rational), with a special emphasis on linear and quadractic expressions and equations.

**UNIV 0301. Integrated Reading/Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
skills. The focus of the course will be on applying critical reading skills for organizing, analyzing, and retaining material and developing written work appropriate to the audience, purpose, situation, and length of the assignment. The course integrates preparation in basic academic reading skills with basic skills in writing a variety of academic essays. This is a course with a required lab. The course fulfills TSI requirements for reading and/or writing.

**UNIV 0331. Non-course Competency-Based Option and Intervention - BASE MATH. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Topics in mathematics such as arithmetic operations basic algebraic concepts and notation, geometry and real an complex number systems for student who test on the TSI assessment at the Adult Basic Education Level.

**UNIV 0332. Non-course Competence-Based Option and Intervention - BASE Writing. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Development of college-level writing focusing on idea generation, drafting, organization, revision, and utilization of standard English for students who test on the TSI assessment at the Adult Basic Education Level.

**UNIV 0334. Non-course Competence-Based Option and Intervention - BASE Reading. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Development of reading and higher order thinking skills necessary for college readiness for students who test on the TSI assessment at the Adult Basic Education Level.

**UNIV 0350. NCBO - ESOL - Reading and Vocabulary. 3 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Develops English reading proficiency and vocabulary for academic, career, or personal purposes in speakers of languages other than English and prepares them to function in a multicultural , multilingual society.

**UNIV 1100. Transitioning to University Studies-Alternative First Year Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in the development of skills for academic success, promote personal growth and responsibility, and encourage active involvement in the learning process.

**UNIV 1102. Learning Frameworks I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
A study of the 1) research and theory in the psychology of learning, cognition, and motivation; 2) factors that impact learning; and application of learning strategies. Theoretical models of strategic learning, cognition and motivation serve as the conceptual basis for the introduction of college-level student academic strategies. Students use assessment instruments (e.g., learning inventories) to help them identify their own strengths and weaknesses as strategic learners. Students are ultimately expected to integrate and apply the learning skills discussed across their own academic programs and become effective and efficient learners. Students developing these skills should be able to continually draw from the theoretical models they have learned.

**UNIV 1201. Learning Frameworks II. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
A study of the 1) research and theory in the psychology of learning, cognition, and motivation; 2) factors that impact learning; and application of learning strategies. Theoretical models of strategic learning, cognition and motivation serve as the conceptual basis for the introduction of college-level student academic strategies. Students use assessment instruments (e.g., learning inventories) to help them identify their own strengths and weaknesses as strategic learners. Students are ultimately expected to integrate and apply the learning skills discussed across their own academic programs and become effective and efficient learners. Students developing these skills should be able to continually draw from the theoretical models they have learned.

# Veterinary Technology

## Courses

**VETE 3112. Strengths Based Leadership. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course focuses on the theories, concepts and principles of leadership. Emphasis will be on the development of leadership skills through the four domains of leadership strength: Executing, Influencing, Relationship Building, and Stategic Thinking. Prerequisites: Enrollment in Veterinary Technology program or permission of program Department Head.

**VETE 3313. Radiology & Clinical Imaging. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course teaches veterinary technician students beyond the fundamentals of taking and developing radiographs. Topics include descriptive positioning, digital radiographic techniques and quality calculations, and radiation safety procedures. Other imaging technologies include ultrasound, fluoroscopy, MRI, CT scan, and nuclear scintigraphy. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 3316. Clinical Cardiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The concepts of cardiology are designed to give veterinary professionals the solid foundation on cardiovascular disorders that represent a substantial portion of diseases seen in veterinary practice. The course will explore the most common cardiology diseases, the diagnostics, and therapeutic principles of veterinary cardiology allowing students to see cardiac disorders in a step-by-step fashion including pathophysiology, history, physical exam, electrocardiography, thoracic radiography, special diagnostic techniques, differential diagnosis, and the therapeutic approach. Prerequisites: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 3317. Veterinary Microbiology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Animal disease etiologies occurring in North America and global trans-boundary diseases. A systematic approach of describing infection and disease states to compare differences and similarities across affected species. Prerequisites: Enrollment in the Veterinary Technology Program; or Biology 1407 and upper division standing; or BIOL 1407 and ANSC 2350; or approval of the Department Head.

**VETE 4086. Veterinary Technology Special Problems. 1-3 Credit Hours (Lecture: 0 Hours, Lab: 1-3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This is an advanced course in veterinary technology. Problems assigned according to experience, interest, and needs of individual students. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4111. Safety & Regulatory Compliance. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course will introduce and heighten awareness of veterinary specific safety hazards and regulatory compliance issues. The course is designed to acquaint veterinary technician learners to the following: (1) personal safety hazards, (2) patient safety hazards, (3) Human Resource issues related to safety, (4) licenses, permits, and registrations, (5) Occupational and Safety Health Administration (OSHA), and (6) reproductive and gender issues. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head .

**VETE 4163. Shelter Animal Medicine I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Students will learn to evaluate and modify protocols to enhance the physical health and well-being of sheltered dogs and cats as well as recognize and respond to common threats to physical health. Students will explore medical concepts related to population management, sanitation, facility design, and animal housing.

**VETE 4164. Shelter Animal Medicine II. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Students will learn to manage infectious disease outbreaks common to the shelter setting, as well as address animal cruelty in multiple species. Prerequisite: VETE 4163.

**VETE 4165. Shelter Animal Medicine III. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Evaluate the quality of a shelter's behavioral health programs and implement changes to promote welfare and placement of sheltered dogs and cats. Investigate critical shelter animal behavior and welfare concepts including behavioral assessments, behavioral modification protocols, diagnosis of common behavioral problems, and medical treatments of selected behavioral disorders. Address spay/neuter protocols and in shelters. Prerequisites: VETE 4163 and VETE 4164.

**VETE 4166. Veterinary Forensics I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Understand the procedures and protocols used when processing an animal crime scene. Understanding the legal system and the role and responsibility of the veterinarian.

**VETE 4167. Veterinary Forensics II. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course will focus on the examination of the animal, as well as special considerations for animal cruelty, postmortem changes, and forensic entomology. Prerequisite: VETE 4166.

**VETE 4168. Veterinary Forensics III. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course allows students to explore various areas of trauma and injury that can occur in forensics, such as: blunt force trauma, sharp force injury, burn-, electrical-, and fire-related injuries, and firearm injuries. Prerequisites: VETE 4166 and VETE 4167.

**VETE 4181. Veterinary Practice: Law & Ethics I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This first course in veterinary law & ethics is designed to provide students with an understanding of the legal principles required by State and National licensing boards within the scope of veterinary practices. Emphasis is placed on the principles and policies which veterinarians and technicians receive through continuing education in order to maintain license. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4182. Veterinary Practice: Law & Ethics II. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This second in a series course in veterinary law & ethics is designed to provide students with a continuing understanding of the legal principles required by State and National licensing boards within the scope of veterinary practices. Emphasis is placed on the principles and policies which veterinarians and technicians receive through continuing education in order to maintain licensure. Prerequisite: VETE 4181.

**VETE 4208. Veterinary Research. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course is collectively designed to provide veterinary technology students an introduction to biomedical research and career opportunities in veterinary medicine. It is centered on supporting veterinarian technicians who are seeking to develop their scientific knowledge and research skills. Unmet needs for veterinary technician expertise exist in sectors of veterinary medicine, such as Biomedical Genomics, Genetics and Bioinformatics, Physiology, Pharmacology, Cardiovascular Sciences, Infectious Diseases, Biodefense and Immunology, Neuroscience, Anatomy and Functional Imaging, Reproductive Biology, Development and Epigenetics, Toxicology, Environmental Health Science, and Food Safety. Prerequisites: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4209. Veterinary Technology: Capstone. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
The capstone course is an opportunity for students to demonstrate achievement of the goals for learning established by the Veterinary Technology Program . The course is designed to assess cognitive, affective and psychomotor learning and to do so in a student-centered and student-directed manner which requires the command, analysis and synthesis of knowledge and writing skills. The capstone course integrates learning from the courses within the major and the academic experience. This course is highly recommended to be taken in the last semester. Prerequisites: VETE 4208, enrollment in the Veterinary Technology Program, upper division standing or approval of the Department Head.

**VETE 4251. Veterinary Practice: Administrative Tools for Success. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course outlines time tested tools and systems for improving a veterinary practice manager's administrative skills and performance standards. The mind-set need to achieve an important goal is studied through discussions that mark and define progress and setting achievable goals; success mapping! Prerequisite: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4252. Veterinary Practice: Teaching Techniques. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course explores the development and delivery of front office skills, etiquette and medical practices required of veterinary technicians in carrying out their profession. A wide variety of models and exemplars focus on the integration of client, medical supplier, veterinary resources and supportive biomedical technologies that contribute to the veterinary practice and profession. Prerequisite: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4253. Shelter Animal Medicine I. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Evaluate protocols to enhance physical health and well-being of shelter animals, recognition and response to common health threats and infectious disease outbreaks. Medical concepts related to population management, sanitation, facility design, and housing.

**VETE 4254. Shelter Animal Medicine II. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Address animal cruelty in multiple species; investigate critical shelter animal behavior and welfare concepts including behavioral assessments, behavioral modification protocols, diagnosis of common behavioral problems, and medical treatments of selected behavioral disorders; address spay/neuter protocols in shelters. Prerequisite: VETE 4253.

**VETE 4255. Shelter Animal Medicine III. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Study of shelter animal medicine and its role in disaster management. Special considerations for animal shelter management and for animal care and evaluation resulting from natural disasters. FEMA procedures for animal shelters. Prerequisite: VETE 4254.

**VETE 4256. Veterinary Forensics I. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Procedures and protocols used when processing an animal crime scene; the role and responsibility of the veterinarian and veterinary professionals within the legal system; special considerations for animal cruelty.

**VETE 4257. Veterinary Forensics II. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Examination of the animal with special considerations for animal cruelty, postmortem changes, and forensic entomology. Explore areas of trauma and injury of common interest to forensics, such as: blunt force trauma, sharp force injury, burn-, electrical-, and fire-related injuries, and firearm injuries. Prerequisite: VETE 4256.

**VETE 4259. Companion Animal Dermatology. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course will cover the presentation, recognition and diagnostics necessary to identify skin diseases and provide clinical guidelines for the successful management of skin diseases commonly seen in veterinary practice. Consideration of the diagnostic approach toward the dermatology patient, precancerous conditions, zoonoses, and breed predispositions are examined along with dermatologic drugs and toxicities. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4260. Companion Animal Ophthalmology. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course examines clinical canine/feline ophthalmology. Coverage of the most commonly diagnosed and treated neuro-ophthalmology and systemic diseases afflicting the eye are considered. Prerequisites: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4262. Dental Procedures & Techniques. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course covers the 12-step dental cleaning procedure, oral pathology, instrumentation used in cleaning, equipment, dental radiology, interpretation of dental radiographs. digital dental radiography systems, utilization of digital systems to promote client acceptance of treatment plans, dental charting, and implementing a higher level of dental care in a general practice. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4270. Integrative Medicine. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
Holistic approach to animal examination, diagnosis and treatment modalities considering all aspects of the animal's life and focusing on culturally-alternative aspects of treatment such as: acupuncture, herbal medicine, chiropractics, tui na, and therapeutic nutrition. Prerequisites: Enrollment in the Veterinary Technology Program; or Biology 1407 and upper division standing; or BIOL 1407 and ANSC 2350; or approval of the Department Head.

**VETE 4271. Equine Lameness & Treatment Modalities. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
This course analyzes the causes, diagnoses, and management of the myriad causes of lameness such as: defining and identifying the lame leg; spotting gait abnormalities and non-muscular causes; physical examinations and evaluations; diagnostic tools and other tests; the role of the veterinarian and farrier in pre-purchase examinations. Physical therapies along with treatment of specific conditions to the foot, pastern and fetlock, cannon and splint bones, knee, upper foreleg, hock, upper hind leg, and back are studied. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4272. Equine Forensics: Cruelty. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course focuses on assessment and investigation into large animal (equine) cruelty cases. It covers and describes methods for assessing starvation, body condition scoring, hoof care, dental care, and accidental and non-accidental injuries. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4273. Emergency & Critical Care of Horses. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course addresses the role of veterinary technicians in equine emergency and critical care. It covers and describes dozens of common, life-saving protocols and procedures. Patient assessment, equipment, therapies and techniques are discussed along with important drug information. Specific systemic problems such as hematologic, cardiovascular, gastrointestinal emergencies, shock and trauma are covered. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4274. Equine Dermatology & Ophthalmology. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course describes the structure and function of the skin, and discusses disorders including bacterial, fungal, parasitic, viral, protozoal, allergic, immune-mediated, endocrine, metabolic, and nutritional diseases. It also covers congenital and hereditary defects, pigmentation abnormalities, keratinization defects, environmental skin diseases, and skin tumors. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4275. Equine Learning & Behavior. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
This course explains learning theory, and offers practical advice on reward systems, positive and negative reinforcement, and overcoming fears and phobias. and how to apply it in a way that is both efficient and holds the horse's welfare paramount. It also a range of practical tools to employ in solving equine behavior problems, and training tasks and case studies demonstrate these tools in use. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4283. Veterinary Practice Management Internship. 2 Credit Hours (Lecture: 2 Hours, Lab: 0 Hours).**
The Technician Manager Internship is designed to expose students to the daily practice-management activities that may be encountered in a veterinary practice, an animal research facility, or other allied animal-health facility. A minimum of 480 hours of participation in a veterinary manager internship position in a faculty-approved facility is required. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4305. Pharmacology & Pharmacy. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course deals with pharmacodynamics, pharmacokinetics, clinical/therapeutic uses and toxicology of drugs. Emphasis is given on how a drug works to anticipate outcomes. Nursing responsibilities include administering drugs, calculating medication dosages based on given setting, assessing drug effects, intervening to make a drug more tolerable, and providing teaching about drugs and the drug regimen. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4313. Animal Welfare & Ethics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Course content includes and focuses on the ethics of animal use, physiological and psychological aspects of adverse states, examination of animal environments, the role of the veterinarian and the profession in in animal welfare, knowledge and understanding of welfare issues, animal legislation and cruelty law, and further characterization and understanding of the human - animal bond. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4321. Companion Animal Diseases & Health Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will focus on the nursing care required by companion animals as the result of disease or neonatal, geriatric, and obstetrical needs. The course objectives are to assess a student's knowledge base and then help him or her gain the knowledge to maintain the health, well-being, and longevity of companion animals. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4323. Companion Animal Nutrition & Care. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The essentials of companion animal nutrition including pet food regulation ingredients, labels and guaranteed analysis. Life cycle feeding management of healthy pets and during disease and debilitating injury. Prerequisites: Enrollment in the Veterinary Technology Program; or BIOL 1407 and ANSC 2350; or approval of the Department Head.

**VETE 4325. Companion Animal Anesthesiology & Surgical Nursing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides detailed coverage of the physiological, pharmacological and physical aspects of anesthesia. Detailed case study is utilized to build knowledge and understanding of anesthetic principles. Nursing skills are given emphasis toward pre- and post operative procedures. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4326. Companion Animal Emergency-Critical Care & Pain Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will focus on learning and applying emergency care, critical care and pain management techniques appropriate for veterinary technicians. The student will acquire knowledge of the proper use of drugs, fluids, and equipment for emergency and critical care patients. Students will also learn to evaluate these patients through physiological monitoring and life support measures in the intensive care unit (ICU). Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4331. Equine Disease & Health Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a comprehensive study of the essential elements necessary to promote goo health among horses. Living environments, fencing, pasture, grooming, vaccination protocols, de-worming protocols, hoof care, dental care, etc. are addressed and discussed through case scenarios and models. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4333. Equine Nutrition & Care. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides in-depth information on the function and peculiarities of equine gastrointestinal physiology and the importance of the nutrients that are essential for equine well-being. In addition to discussions of common feeds and supplement, topics will include how to read and interpret commercial feed labels, the balancing of rations, and the use of feed analyses and computer analysis programs. Course content is presented entirely online. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4335. Equine Anesthesiology & Surgical Nursing. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides detailed coverage of the physiological, pharmacological and physical aspects of anesthesia. Detailed case study is utilized to build knowledge and understanding of anesthetic principles. Nursing skills are given emphasis toward pre- and post operative procedures. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4337. Equine Colic. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course explores the various etiologies and physiological responses of horse that are afflicted with gastrointestinal insufficiency. Each of the 5 main causative factors of equine colic are discussed and evaluated for health implications and measures necessary for a return to uncomplicated recovery. Prerequisites: Enrollment in the Veterinary Technology Program and upper division standing or approval of the Department Head.

**VETE 4351. Veterinary Practice: Administration and Organization. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Designed for veterinary technicians, this course explores the decision making responsibility within a veterinary practice environment in which to improve its competitive advantage. This course examines how the long-term organizational success of veterinary services can be achieved through effective policies and operating procedures. Prerequisite: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4352. Veterinary Practice: Fiscal Analysis and Planning. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course examines the specific financials of veterinary practice and statement analysis that are one of the most challenging areas for practice managers. Also covered are facility additions/improvements, equipment, vehicles, and other capital expenditures that requires the practice manager to proactively conduct a thorough analysis of projected client (statement) income and projections to facilitate sound decision making. Also, under consideration are the variable pricing models - veterinary hospitals have a number of potential pricing models to choose from when setting fees. Prerequisite: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4354. Veterinary Practice: Client/Consumer Behavior and Practice Branding. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will explore the veterinary practice manager's role in facilitating client education directed at the health care needs of their animals' and insuring for health care needs while growing the practice through internal and external promotions and educational programs. This course also examines veterinary wellness and preventative health care plans as well as communicating the benefits of product, place, price, promotion and branding. Prerequisite: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Director.

**VETE 4355. Veterinary Practice: Supervision and Leadership. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to identify key interpersonal relationships in veterinary practice that leaders must foster and develop for long term success. Supervision in large and small practices; consisting of administrative, technical and support staff is also covered. A discussion planner (tool) for veterinary technicians/managers to develop interdependency, trust and effective communication will be utilized. Prerequisites: Enrollment in the BAS Veterinary Technology Program and upper division standing or approval of the Director.

# Wildlife, Sustainability and Ecosystem Sciences

## Courses

**WSES 1100. Transitioning to University Studies in the Natural Resource Sciences. 1 Credit Hour (Lecture: 1 Hour, Lab: 1 Hour).**
Practical study designed to prepare the student for university life, aid in development of skills for academic success, promote personal growth and responsibility, encourage active involvement in the learning process from an individual college perspective, and introduce students to the field of wildlife, sustainability, and ecosystem sciences. Prerequisites: Major in WSES or approval of the instructor.

**WSES 1119. Natural Resource Competition I. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course provides an introduction to various natural resource-based competitive events. Competition rules, conduct, and etiquette are discussed. The students are introduced to basic facts regarding their chosen field of study. Prerequisites: Approval of the instructor.

**WSES 1301. Society, Natural Resources, and the Environment. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course provides a broad overview of the role of the environment and natural resources in human society, with particular emphasis on Texas and the United States. A history of the environmental movement is presented. Students study the importance of natural resources in providing basic human necessities, and how these resources are managed. Various careers in environmental science, natural resource management, and wildlife conservation are also discussed.

**WSES 1307. Concepts and Controversies in Food Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles of food studies and exploration of the role food narratives and exposés play in the consumer’s perception of the current food supply. Foundation for understanding the connections among food production, ecology, ethics, cuisine, nutrition and health within the framework of sustainability. Can receive credit for either FDSC 1307 or WSES 1307.

**WSES 2119. Natural Resource Competition II. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Intended for students with basic understanding of the conduct of their chosen natural resource event, this course provides more advanced study of the topic. Students expand upon the introductory material discussed in Natural Resource Competition I to include a wider array of natural resource science related facts and concepts. Prerequisites: WSES 1119 or approval of the instructor.

**WSES 2301. General Entomology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Principal orders of insects; the relation of anatomy and physiology of insects to control methods; insecticides and their uses; development, habits, and economic importance of more common insects with control methods for the injurious species. Prerequisite: C or better in BIOL 1406 or BIOL 1407.

**WSES 2322. Principles of Wildlife Conservation and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An in-depth treatment of the fundamental principles of wildlife conservation and management, stressing the application of ecological principles to achieve wildlife management objectives. Topics include conservation, management, and restoration of wildlife habitats; wildlife population assessment and management; human dimensions and human-wildlife interactions; management of wildlife in agricultural, range, and forested ecosystems; and wildlife policy at the local, state, national, and international level. Provides knowledge and understanding required for advancing in the wildlife and natural resource conservation disciplines. Satisfies requirements for Wildlife Science majors. Prerequisite for advanced wildlife science courses. Prerequisites: Grade of C or better in BIOL 1406 and BIOL 1407; grade of C or better in MATH 1316 or MATH 2412; and grade of C or better in WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 2375. Soil as the Basis for Society. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
The underpinnings of the scientific principles of soils, how people have harmed them, and why everyone should be concerned with how we treat them. This course may not be used to fulfill the degree requirements for wildlife or ecosystem sciences.

**WSES 2405. Ecology for Natural Resource Managers. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
A study of the interactions of plants, animals, and the environment and how these interactions respond to human influence. Emphasis will be placed on terrestrial ecosystems (rangelands, grasslands, deserts, wetlands, and forests), and specific interactions among species which can be manipulated to achieve management outcomes. The laboratory will have a significant outdoor field component. Credit will not be awarded for both WSES 2405 and WSES 3103. Prerequisite: Grade of C or better in BIOL 1406 OR BIOL 1407.

**WSES 2451. Introduction to Geographic Information Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Basic concepts of design, planning and implementation of geographic information systems. Students will learn how to create, manipulate, project, and interpret geographic information. Students are encouraged to take GEOG 1451: Pre-GIS before this course. Can receive credit for either WSES 2451, GEOG 2451, EASC 2451 or ENVS 2451. Lab fee: $2.

**WSES 3103. Ecological Field Methods Laboratory. 1 Credit Hour (Lecture: 0 Hours, Lab: 4 Hours).**
Field methodologies used in the investigation of ecological systems including terrestrial plant, terrestrial animal, and aquatic systems. For students who have completed an introductory ecology or environmental biology course with no laboratory component. Credit will not be offered for both WSES 3103 and WSES 2405. Prerequisites: Grade of C or better in an approved 1000- or 2000-level ecology or environmental biology course; and a grade of C or better in BIOL 1406; and a grade of C or better in either BIOL 1407 or GEOL 1407; or approval of the department head.

**WSES 3119. Natural Resource Competition III. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course is a more advanced treatment of the student's chosen natural resource event. It is intended for students with experience in the competition, having participated in at least one competitive event. Prerequisite: WSES 2119 and approval of the instructor.

**WSES 3303. Veterinary Entomology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Classification, biology, and control of arthropods associated with livestock and wildlife. Identification will be emphasized in the laboratory. Prerequisites: BIOL 1406 and BIOL 1407, or approval of the instructor.

**WSES 3304. Food Processing. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
The world food supply, trends and traditions in diet and food sanitation, safety, security, and biotechnology, and impact of processing on diet quality. Lab fee: $2.

**WSES 3305. GIS for Natural Resource Scientists. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An intermediate course on the use of geographic information systems (GIS) in natural resource management. Builds on concepts learned in introductory GIS course. Laboratory exercises will apply knowledge learned in lectures to solve real world problems in natural resource management using GIS software. Prerequisite: WSES 2451 Lab fee $2.

**WSES 3307. Systems Thinking. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course focuses on the examination and analysis of complex systems, particularly in the environmental, natural resources, and sustainability fields. Major topics will include system structure, system behavior, feedback loops, stock and flow models, non-linear and emergent properties, self-organization, and the application of systems thinking to problem-solving. A significant component of the course will be development and analysis of computer models of complex systems. Prerequisite: C or better in MATH 1314 or equivalent, or approval of the instructor. Lab fee: 2.

**WSES 3308. Analysis of Natural Resource Data. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Application of statistical principles to the analysis of natural resource science data. Methods of designing studies, managing and analyzing data, and interpreting results. Descriptive statistics, estimation, inference, tests of significance, measurements of relationship and correlation, and non-parametric analyses. Prerequisite: Grade of C or better in MATH 1342 or MATH 3450.

**WSES 3309. Aquaponics. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Students will examine the pros and cons of various aquaponics methods like raft, nutrient film, vertical towers, and media filled beds and their applications for growing fish and plants sustainably for a family/community or for profit. Students will construct a backyard aquaponics system, establish/harvest plants, and prepare a meal in laboratory. Topics covered are plant and fish choices and recommendations; planting/growing techniques; fish biology, stocking rates, and feeds; plant/fish care and health; water quality; system design, filtration and plumbing components; daily operation; greenhouse management/seasonal adjustments; system start up; food preparation; economics and business considerations.

**WSES 3310. Wildlife Management Techniques. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Field and laboratory techniques used in wildlife management and research. Determining age and food habits, population analysis, habitat analysis, and introduction to research. Modest cost of field trips will be borne by student. Prerequisites: Grades of C or better in WSES 2322, and either MATH 1316 or MATH 2412.

**WSES 3311. Wildlife Diseases. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Basic mechanisms of disease as they occur in wildlife populations; interplay of environmental conditions, individual physiological requirements, and disease agents of various wildlife species. Epidemiology and management of infectious and non-infectious diseases. Prerequisites: Grade of C or better in WSES 2322 or approval of instructor.

**WSES 3313. Plant Diversity and Conservation. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Patterns and distribution of plant diversity and threats to plant diversity. Plant communities found in a variety of range, forests, and other systems. Strategies and approaches used in plant conservation will be discussed. Prerequisite: Grade of C or better in WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 3314. Pollinator Ecology and Conservation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The role of pollinators in the ecosystem, including interactions with their food plants. Discussion of major pollinator groups, including arthropods, birds, and mammals. Threats and conservation strategies. Prerequisite: Grade of C or better in WSES 2405 or BIOL 4401.

**WSES 3315. Sustainability. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Explore the varied perspectives of sustainability and analyze factors that contribute to or decrease system sustainability. Investigation of the social, economic, and environmental barriers to achieving sustainable systems and options for overcoming these barriers. Credit will be awarded only for POLS 3315, ENVS 3315, or WSES 3315.

**WSES 3319. Composting. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
The art and science of composting of agricultural, municipal, foodservice and household wastes to include composting techniques, waste products and feedstocks, aerobic vs. anaerobic processes, evaluation of composted products and their beneficial uses. Biological processes used to decompose organic materials will be studied. Prerequisites: Junior standing or permission of the instructor.

**WSES 3320. Watershed Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Management and planning of range or forest land watersheds for maintenance or improvement of water and soil resources. Effects of vegetation and land management practices on water quality and quantity, erosion, and sedimentation. Prerequisite: Grade of C or better in WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 3323. Ethical Issues in Agriculture and the Natural Resources. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students will examine the several major ethical issues facing agriculture and natural resources sciences in our current society. Readings, discussions and lectures will focus on the scientific, capitalistic, and philosophical motivation in common ethical issues. Upon completion of the course, students will be able to construct and dissect ethical arguments and hopefully become more aware of the ethical dilemmas we all face each day.

**WSES 3340. Fisheries Conservation and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Fundamentals of fisheries management population estimation and management, harvest management, habitat management, applicable state and federal laws, invasive species management, and human dimensions. Prerequisites: Grade of C or better in WSES 2322.

**WSES 3375. Population, Pollution, and Resource Depletion. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Principles and philosophies associated with the development, management, and use of natural resources are studied in the relationship to the ecological and social implications inherent in management alternatives involving the natural environmental and the use of renewable natural resources. Prerequisite: junior classification.

**WSES 3380. Integrated Pest Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An introduction to the basic tenets of integrated pest management emphasizing the ecologically sound use of chemical, biological, cultural, and physical control tactics in managing pests. Prerequisites: WSES 2301 and Junior or Senior classification, or approval of instructor of record.

**WSES 3385. Fish and Wildlife Laws and Administration. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
A review and analysis of state and federal laws and international treaties and conventions affecting fish and wildlife; their application and administration. The organizational structure of state, federal and international agencies; their objectives, policies and practices. Prerequisite: Grade of C or better in WSES 2322.

**WSES 3386. Human Dimensions of Fish and Wildlife Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Today's natural resource scientist must interact with diverse publics and stakeholders to achieve conservation goals. Few professionals receive training to navigate the murky waters of human dimensions of natural resources management. This course will give students an understanding of ways in which elements of human psychology and society shape our perceptions and management of wildlife and fisheries resources, and how to interact with these stakeholders to achieve ecologically-sound management and conservation. Prerequisite: Grade of C or better in WSES 2322.

**WSES 3387. Natural Resource Conservation Outreach and Interpretation. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Survey of the history, principles, and content of the Texas Master Naturalist Program as an example of education, public outreach, volunteerism, and interpretation in natural resource conservation and management. Classroom and field instructional modules of foundational concepts and regional specifics about biotic and abiotic natural resources. Principles of interpretation and written analysis of observed teaching and interpretive activities by resource specialists. Students who co-register with the Prairie Oaks Chapter of the Texas Master Naturalist program and complete all class activities can satisfy a portion of the requirements for certification as a Texas Master Naturalist. Attendance at occasional weekend field trips required.

**WSES 3401. Soils. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Designed to acquaint the student with the field of soil science. Basic principles of the physical, chemical, and biological properties of the soil and their general applications. Prerequisite: CHEM 1411, CHEM 1407, or CHEM 1409.

**WSES 3403. Natural History of the Vertebrates. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Survey of vertebrate taxa, including systematics, taxonomy, anatomy, physiology, and ecology. Identification in laboratory and field. Students required to handle preserved and live specimens. Students required to bear the cost of multiple overnight and multi-day field trips. Prerequisites: Grade of C or better in BIOL 1406 and BIOL 1407.

**WSES 3406. Wildland Plant Identification and Ecology. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Identification and classification of grasses and other herbaceous plants in the North America, with emphasis on distribution, ecology, and economic value of species found in rangeland, forest, grassland, desert, and wetland systems in Texas. Proficiency in the use of a dichotomous key to identify plant species will be emphasized. Prerequisite: WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 3408. Dendrology and Woody Plant Identification. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Study of woody plants, including trees, shrubs, and vines. Morphological, ecological and phenological traits will be used in field identification. The distribution, habitat, ecology, and importance of these species to wildlife and people will be explored, including community dynamics and the effects of disturbance and succession. Proficiency in the use of a dichotomous key to identify plant species will be stressed. Prerequisite: WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 4084. Internship in the Natural Resource Sciences. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Formally arranged and approved on-the-job training with a cooperating sponsor in government of private sector of the natural resources or environmental field. A minimum of 75 hours of training is required for each hour of academic credit. A maximum of six hours of credit may be earned. Oral and written reports of the experience are required. Prerequisite: Approval of the instructor. Lab fee: $2.

**WSES 4086. Problems in Natural Resource Sciences. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Individualized study of current topics in wildlife, natural resources, environmental science, or related discipline. Specific content and credit depend upon student's interests, needs, and depth of study. May be repeated as topics vary. Prerequisite: approval of instructor.

**WSES 4088. Undergraduate Research in the Natural Resource Sciences. 1-6 Credit Hours (Lecture: 0 Hours, Lab: 1-6 Hours).**
Fundamental research methods will be addressed through a faculty-directed project. Participation in an abbreviated lecture series may be required. Project components may include a literature review, data collection and analysis, testing, planning, project design, and/or computer modeling. the student may be required to prepare a final report and produce a presentation. Prerequisites: Approval of the instructor.

**WSES 4090. Special Topics in the Natural Resource Sciences. 1-6 Credit Hours (Lecture: 0-6 Hours, Lab: 0-6 Hours).**
Selected topics in wildlife, natural resources, environmental science, or related discipline. May be repeated for credit when topics vary.

**WSES 4119. Natural Resource Competition IV. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This course is intended for highly advanced students who have developed significant experience and competencies in their respective natural resource competition. Students will be expected to take a leadership role on the Tarleton State University Quiz Bowl Team and demonstrate significant ability during practice and competitive events. Prerequisite: WSES 3119 and approval of the instructor. Prerequisites: WSES 3119 and approval of the instructor.

**WSES 4185. Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
Discussions of issues and developments in agriculture, natural resources, or environmental sciences.

**WSES 4187. Senior Capstone Seminar. 1 Credit Hour (Lecture: 1 Hour, Lab: 0 Hours).**
This one-hour seminar is designed to provide students with skills at synthesizing and presenting the results of lower-division work, specifically applied learning experiences such as internships, undergraduate research, and study abroad. Course will include a writing and public speaking component. Prerequisites: Successful completion of WSES 4084, WSES 4088, WSES 4340, or WSES 4342, or approval of the Department Head.

**WSES 4301. Population Dynamics, Modeling, and Analysis. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
An introduction to population biology, including models of simple population growth, competition, and predator-prey interactions; demographic rates; and life tables. Prerequisites: Grade of C or better in WSES 2322; and a grade of C or better in MATH 1342 or MATH 3450; or approval of instructor.

**WSES 4302. Habitat Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Application of ecological principles to the management of native plant communities. Particular focus will be on plant ecology and physiology and their role in the conservation and management of wildlife habitat. Prerequisite: Grade of C or better in WSES 2322, or approval of the instructor.

**WSES 4303. Ecological Restoration. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Landscape-scale, process-oriented approaches to ecological restoration. Enhancing resource capture, techniques in re-vegetation, and restoration of historic vegetation. Prescribed fire and grazing as restoration and management techniques for range and forest systems. Prerequisites: BIOL 3415, RNRM 3300, WSES 3406, or WSES 3408; and a grade of C or better in WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 4304. Population Genetics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An exploration of the principles of population genetics. Lecture will be a discussion of factors affecting the dynamics of allelic frequencies and the population-level consequences of manipulating these factors. Lecture topics will include the effects of selection, mutation, population size and genetic drift, neutral theory, population structure, inbreeding, and linkage disequilibrium. A significant portion of the class will be dedicated to working on problem sets to provide an empirical connection to population genetic theories. Prerequisite: BIOL 3303, BIOL 3403, or AGRI 3409.

**WSES 4305. Urban Wildlife and Fisheries. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course trains students to establish and maintain diverse, self-sustaining urban wildlife and fish populations at levels in harmony with ecological, social, an economic values of the human community and to develop optimal levels of public appreciation and use of urban wildlife an fish resources and associated habitats. Includes discussions on conservation education as a tool for furthering urban wildlife and fisheries appreciation.

**WSES 4306. Water Resources Policy and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course will present an overview of water policy, laws and regulations related to ecosystem resource management focusing on water quality, water quantity and water as habitat. Major US and Texas environmental laws regarding water will be covered including the respective agencies involved with regulations. Case studies will facilitate discussion of science-policy interactions with resource management in the implementation of these laws and regulations. Credit for SOCI 4306, WSES 4306, and SOCI 5306 will not be awarded.

**WSES 4308. Horticultural Entomology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Identification, nature of injury, life history, and control of common insects and related arthropods attacking turf grasses, landscape plants, shade, fruit, and nut trees, and greenhouse succulents. Management and control strategies utilizing chemical, cultural, and biological control agents.

**WSES 4309. Plant-Animal Interactions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours). [WI** (http://catalog.tarleton.edu/undergrad/academicaffairs)**]**
Arthropods and vertebrates in aquatic, terrestrial, managed, and natural systems spanning multiple scales and levels of organization. Prerequisite: Grade of C or better in WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 4311. Fire Ecology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Ecological role of fire in natural systems, including rangelands, grasslands, shrublands, woodlands, and forests; adaptations of plants and animals to fire; long-term controls on wild fire; use of fire as an ecosystem management tool, with aspects of wildland firefighting; and prescribed burning, including fire behavior, fuels, weather, politics and policy. Hands-on prescribed burning experiences as circumstances and weather permit. Prerequisite: WSES 2405, RNRM 3315, or BIOL 4401.

**WSES 4313. Vegetation Measurement, Inventory, and Monitoring. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Vegetation sampling, measurement, monitoring, inventory, study design, and quantitative and statistical analysis. Assessment of range condition and forest health based on understanding ecological processes. Hands-on, field-based laboratory. Prerequisite: WSES 3406 or WSES 3408.

**WSES 4316. Pesticides. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A survey of chemical pesticides. Emphasis will be on the chemistry, mode of action, and safe use of insecticides, herbicides, and fungicides. Less common pesticides (rodenticides, piscicides, avicides, etc.) will also be reviewed. The use of chemical pesticides as a part of an integrated pest management program will be discussed. Student's successfully completing the course will be prepared to apply for the Texas Department of Agriculture pesticide applicator's license. Prerequisite: CHEM 1411.

**WSES 4324. Organic Agriculture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Organic agriculture will examine a brief history of the industry development, changes in the structure and industry, USDA NOP rules and regulations, and certification to provide a scope of understanding for the course. The majority of the course will focus on the mechanics of crop and vegetable production in an organic system including seed sources, planting considerations, environment, soil fertility, plant nutrition, soil preparation, weed control methods, insect and disease prevention, rules in applications, harvest issues, and marketing.

**WSES 4325. Crop Production and Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Current concepts and practices in field crop production with emphasis on the applications of technology. Recognition and discussion of cultural practices, fertilization, irrigation, weed and pest control from economic and environmental perspectives. Review of crop improvement strategies and bio-engineering. Prerequisites: WSES 1305; or AGRI 1307 and AGRI 1107.

**WSES 4326. Big Game Ecology and Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Survey of the distributions and life histories of North American big game species. Detailed examination of the biology and habitat relationships of several big game species, especially as they relate to management. Other topics include population dynamics, diet, economic significance, and conservation strategies. Modest cost of field trips will be borne by the student. Prerequisite: A grade of C or better in WSES 2322, or approval of the instructor.

**WSES 4327. Avian Ecology and Management. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
A study of major wild bird groups, their interactions with their environment, and how these interactions can be manipulated to achieve management objectives. Course emphasis will be on species of conservation significance, including game, nongame, and vulnerable species. Major topics will include population management of migratory and non-migratory birds, habitat management, and wildlife policy consideration unique to bird conservation. Modest cost of field trips will be borne by the student. Prerequisite: A grade of C or better in WSES 2322, or approval of the instructor.

**WSES 4335. Food and Culture. 3 Credit Hours (Lecture: 2 Hours, Lab: 3 Hours).**
A study of the food beliefs and practices of the major ethnic and religious groups in the U. S. and the nutritional implications of these food practices, a cultural analysis of American food trends; ethnic issues and dietary changes; and research methods in food habits. Lab fee: $25.

**WSES 4340. Natural Resource Field Studies. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A field course in which students capture, measure, and mark animals; collect descriptive measures of vegetation that characterizes wildlife habitat; and record field observations using a journal. This course requires one or more extended field trips at student’s expense. Prerequisite: Grade of C or better in WSES 2322.

**WSES 4341. Southern African Ecology and Culture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Ecology of southern Africa, including climate, soils, vegetation, and wildlife. Ecological interactions with development, agriculture, and tourism. Identification and ecology of bird and large mammal species. Conservation of rare, threatened, and endangered species. Culture, politics, and history from the pre-Colonial Period through today, with emphasis on their effects on management of natural resources. Focuses mainly on South Africa, Botswana, Zambia, and Namibia.

**WSES 4342. Study Abroad. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Conducted at various domestic and international locations for extended periods (frequently outside the United States). Hands-on activities and experiences in agriculture and natural resources. Topics will vary. Enrollment requires a significant study abroad program fee.

**WSES 4401. Ethology. 4 Credit Hours (Lecture: 3 Hours, Lab: 4 Hours).**
An introductory course in the behavior of animals, with emphasis on the natural selection, ontogeny, and function of behaviors as they relate to feeding, reproduction, predator-avoidance, and other traits. Both proximate (sensory, hormonal, genetic) and ultimate (ecological and evolutionary) mechanisms are addressed. Prerequisite: C or better in BIOL 1406 and BIOL 1407, and a C or better in either AGRI 1419 or WSES 2322. Lab fee: $2.

**WSES 4407. Fermentation and Brewing. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course provides a basic understanding of the history of food safety, sanitation, fermentation, fermented foods, beer brewing, wine and cheese making, along with an introduction to industry organization; from commodities production, to processing, distribution, marketing, and sales. The course provides direct hands-on instruction in small-scale brewing. It combines elements of science (chemistry, biology, and physics), economics, food preparation, aesthetics, preferences, and taste. Modest cost of field trips will be borne by the student. Prerequisites: Senior classification and completion of 8 hours of BIOL and 8 hours of CHEM; or approval of the instructor. Must be 21 years of age or older on the first class day to enroll in this course.

**WSES 4408. Sustainable Food Systems. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
This course will survey issues surrounding food production and examine the environmental and social impact of current food production systems. Specific emphasis will be placed on emerging trends to increase the sustainability of food production, distribution, and consumption. This course includes a laboratory field component and will require some field work outside normal class times. Lab fee: $2.

**WSES 4410. Genomics. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An exploration of practical applications for high throughput DNA sequencing technology. Hands-on research projects will provide experience in proper sample collection and preparation, automated robotic DNA library preparation, DNA barcoding, quality control metrics, instrument loading and run initiation, and an overview of data processing for a single instrument run generating hundreds of millions of DNA sequences. Prerequisite: BIOL 3303 or AGRI 3409 Lab fee: $2.

**WSES 4450. Soil Nutrient Cycling. 4 Credit Hours (Lecture: 3 Hours, Lab: 2 Hours).**
Provides an understanding of plant nutrition, soil nutrient cycling, and nutrient management. Includes discussion of soil biological, physical, and chemical properties and interactions with nutrient availability to crops and nutrient fate in the environment. Students will identify plant nutrition/soil fertility problems and recommend corrective action, identify soil and nutrient management. Prerequisite: WSES 3401. Lab fee: $25.

**WSES 5084. Professional Practice. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
This supervised professional practice will involve the student in practical activities in the agricultural or natural resource sciences. The experience is tailored to the to the student's interests, and academic and career goals. Experience may include teaching, independent research, internship, or other applied learning experience. May be repeated once for credit. Prerequisite: Graduate standing.

**WSES 5085. Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).**
A graduate seminar with content varying according to the needs and experiences of students and the instructor of record. May be repeated as content varies. Prerequisites: Graduate standing.

**WSES 5086. Problems in Natural Resource Sciences. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Advanced studies in wildlife, sustainability, ecosystem sciences, and the natural resources. Problems assigned according to experience, interest, and needs of the individual student. May be repeated for credit as topics vary.

**WSES 5087. Research. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Graduate students conduct original research on a variety of topics in the natural resource sciences toward a graduate thesis. Designed for students who will be conducting field research away from the Stephenville campus. Prerequisites: Graduate standing.

**WSES 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 1-6 Hours).**
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: Approved research methodology course and approval of instructor of record.

**WSES 5090. Special Topics in the Natural Resource Sciences. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).**
Selected topics in wildlife, sustainability, ecosystem science, or the natural resources as needed and dependent upon department, faculty, and student interests. May be repeated as topics vary. Prerequisite: Approval of the instructor.

**WSES 5301. Principles of Research in the Natural Resource Sciences. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is a thorough treatment of the philosophy of science as it applies to the ecological, environmental, and natural resource sciences. Starting from the historical foundations of science, students will become familiar with the logical underpinnings of ecological research, including epistemology, the nature of theory, hypothesis testing, and the logic of study design. This course will provide students with a logical understanding of the scientific process, prior to enrollment in more quantitative treatments of study design and data analysis. Students will be required to prepare a complete research proposal in the course. Prerequisite: graduate classification.

**WSES 5302. Natural Resource Ecology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced relationships of ecological principles to natural resource, wildlife, and range conservation and management. Ecology's historical context; evolution; the niche; intraspecific and interspecific competition; vegetation succession; predator-prey dynamics; and spatial ecology. Previous course work in ecology highly recommended.

**WSES 5303. Graduate Field Studies in Ecology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Students explore various facets of ecology during extended field trips to various locations in Texas and the other United States. Topics may vary depending upon location. May be repeated for credit when topics vary. This course requires an extended field trip at the student’s expense (in addition to the field experience fee). Prerequisite: graduate classification, and enrollment by permit only and with approval of the instructor.

**WSES 5304. Wildlife-Habitat Relationships. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study of habitat and wildlife-habitat interactions. This is a graduate level class for individuals with a basic understanding of ecological and wildlife management concepts. Involves review and discussion of important articles on this subject. Includes advanced discussion of concepts such as plant succession, niche, carrying capacity, habitat measurements, and habitat management. Students will learn how habitat and succession may be manipulated to best manage wildlife populations; also how browsers and grazers may affect their habitats. Prerequisites: graduate standing.

**WSES 5305. Cross-cultural Natural Resource Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Designed to expand the student’s understanding of natural resource management in cross-cultural settings. Prepare students in social science, agricultural, environmental, or wildlife management for careers or assignments in and outside the USA that require multi-cultural understanding. Facilitate the student’s adaptation of management skills and knowledge in diverse natural, legal and cultural settings. Content and assignments are flexible so the student can focus on the natural resource and culture of greatest interest. Prerequisites: Graduate standing.

**WSES 5306. Fire Ecology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
This course will address the ecological role of fire in natural systems, rangelands, including grasslands, shrublands, woodlands, and forests; adaptations of plants and animals to fire; long-term controls on wild fire; use of fire as an ecosystem management tool, with aspects of wildland firefighting; and prescribed burning, including fire behavior, fuels, weather, politics and policy. Students will gain hands-on prescribed burning experiences as circumstances and weather permit. Lab fee: $2.

**WSES 5307. Global Natural Resource Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Exploration of the environmental, political, social, and economic factors affecting the use, management, and protection of natural resources worldwide. Impacts of colonization, migration, international development, globalization, energy use, tourism, climate change, and various political systems on natural resource use and management will be analyzed and debated. On-going class discussions to integrate and contextualize research on international natural resource issues. Prerequisites: Graduate standing.

**WSES 5308. Measuring Animal Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced course in the principles and methods of quantitative studies of behavior, with an emphasis on techniques of observation, recording, and analysis.

**WSES 5309. Plant-Animal Interactions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Plant-animal and animal-plant interactions are the basis for many ecosystem functions. This course tailors the study of those interactions to student interests from insects to ungulates, aquatic to terrestrial, managed to natural systems, and individual species to ecosystems. Prerequisite: Graduate classification.

**WSES 5310. Presentation of Scientific Findings. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
This course is designed to teach graduate students in the natural resource sciences and allied fields the principles and practices of presenting the results of scientific research. Course focus will be on preparing and delivering oral research presentations and research posters; and the preparation, submission, and publication of scientific journal articles, technical bulletins, and research reports. Prerequisite: Admission into the Research Track of the MS Program in Agricultural and Natural Resource Sciences and a grade of B or better in BIOL 5380, or approval of the Department Head.

**WSES 5311. Integrated Pest Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
An advanced study of the principles of integrated pest management emphasizing the ecologically sound use of chemical, biological, cultural, and physical control tactics to manage pests. Students will concentrate on one or few commodities, of their choice, and develop a detailed best management plan. Prerequisites: Graduate standing or approval of the instructor.

**WSES 5313. Vegetation Measurement, Inventory, and Monitoring. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Advanced vegetation sampling, measurement, monitoring, inventory, study design, and quantitative and statistical analysis. Assessment of range condition and forest health based on understanding ecological processes. Hands-on, field-based laboratory.

**WSES 5314. Veterinary Entomology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced studies in the classification, biology, and management of arthropods associated with livestock and wildlife systems. Emphasis will be placed on arthropod vectors of pathogens and their role in the epidemiology and management of disease. Prerequisites: Graduate classification or approval of the instructor.

**WSES 5315. Taxonomy of Veterinary Arthropods. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advance study of the taxonomy and identification of arthropods affecting wildlife and domesticate animals. Students will utilize various collecting techniques and dichotomous keys to obtain and identify arthropods associated with wildlife and domesticated animals.

**WSES 5316. Grant Writing and Funding Acquisition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
A course in terminology and processes associated with grant writing and the acquisitions of research funds.

**WSES 5320. Advanced Topics in Ecosystem Biogeochemistry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Multidisciplinary analysis of energy and nutrient transfers within terrestrial ecosystems. Examination of processes system interactions between the atmosphere, biosphere, lithosphere, and hydrosphere.

**WSES 5331. Professional Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Advanced discussion of techniques for communicating technical information to diverse audiences. Topics covered will include written and oral communication, using numerous formats. Prerequisite: Graduate standing.

**WSES 5341. Southern African Ecology and Culture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Ecology of southern Africa, including climate, soils, vegetation, and wildlife. Ecological interactions with development, agriculture, and tourism. Identification and ecology of bird and large mammal species. Conservation of rare, threatened, and endangered species. Culture, politics, and history from the pre-Colonial Period through today, with emphasis a focus on their effects on wildlife and ecosystem management of natural resources. Focuses mainly on South Africa, Botswana, Zambia, and Namibia.

**WSES 5342. Study Abroad. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Conducted at various domestic and international locations for extended periods (frequently outside the United States). Hands-on activities and experiences in agriculture and natural resources. Topics will vary. Enrollment in this course requires a significant study abroad program fee.

**WSES 5350. Pedology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Topics selected from studies of soil-forming processes, soil-geomorphic relations, mineral weathering, new developments in soil classification, and development of pedologic theory. Topics vary from year to year. May be repeated one time for credit.

**WSES 5360. Research Methods for Agricultural and Natural Resource Scientists. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).**
Research design, database management, application and evaluation of statistics and statistical modeling approaches, inferences, and presentation of results. Introduction to programming language for statistical computing and graphics. Applicable to students interested in research at the individual or population level, such as observational, behavioral, or experimental studies conducted in the field or laboratory. Basic understanding of statistical analyses strongly recommended.

**WSES 5380. Research Writing for Agricultural and Environmental Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).**
Preparation of writing samples, technical reviews, and/or professional manuscripts related to various topics in agriculture or environmental sciences.

**WSES 5405. Ecological Modeling for Natural Resource Management. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
An advanced course in the use of computer simulations to model and analyze ecological systems. Based on a firm foundation of system theory, the course addresses the conceptual design, building, evaluation, and testing of simulation models; and the use of models to answer ecological questions. Prerequisites: graduate classification.

**WSES 5410. Genomics. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).**
Technological advancements in DNA sequencing are producing a much more complete picture of how diverse, ubiquitous, and important microbes are in all living systems. This course will provide students with an overview of the roles that microbes play in human health, agricultural production, and ecosystem functionality. A laboratory component will include massively parallel DNA sequencing and microbial community analysis of niche environments utilizing millions of DNA sequence tags. Prerequisite: BIOL 3407 or equivalent. Lab fee: $2.