

ENGR 111 Foundations of Engineering I

Credit Hours: 3

Department: Mathematics, Physics and Engineering

Required or Elective (circle one)

Current Catalog Description:

Introduction to the engineering profession, ethics, and disciplines; development of skills in teamwork, communication, problem solving, logic processing, design and visualization; computer applications including programming and CAD tools. Co-requisite: MATH 118 or 109.

Course Schedule:

3 lecture hr/ wk, 2. lab hr/week

Textbook(s):

Hagen, Kirk D., Intro. to Engineering Analysis, 2/E, ISBN: 9780131453326 } Bundled
Moore, Holly, Matlab for Engineers, ISBN: 9780136156093 }
Horenstein, Mark N., Design Concepts for Engineers, 3/E, 9780131464995
WebAssign Access: www.webassign.com

Coordinator:

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Course Web Page:

WebAssign: www.webassign.com, purchase access code

Prerequisites by Topic:

Math 118 or 109 – Pre-Calculus or Trig (co-requisite)

Course Grading:

Exams	60% (22% (best), 20%, 18% (worst))
Homework/Quizzes/Classwork	20%
Projects	20%

Program Outcome and Course Learning Goals Map:

The Program Outcomes for Engineering Physics are:

- A. an ability to apply knowledge of math, engineering & science
- B. an ability to design and conduct experiments, as well as to analyze and interpret data
- C. an ability to design system, component or process to meet needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- D. an ability to function on multi-disciplinary teams
- E. an ability to identify, formulate, and solve engineering problems
- F. an understanding of professional and ethical responsibility
- G. an ability to communicate effectively
- H. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- I. a recognition of need for, and ability to engage in life-long learning
- J. a knowledge of contemporary issues
- K. an ability to use techniques, skills, and modern engineering tools necessary for engineering practice.
- L. a depth and breadth of knowledge in engineering and physics necessary to work in a multidisciplinary environment

Course Learning Goals:

Upon completion of this course with a C or better, students will:

1. have been introduced to the engineering profession
2. know the fundamental principles and canons of the Code of Ethics
3. have been introduced to various engineering disciplines;
4. have developed skills to work effectively in teams
5. know and be able to apply fundamental concepts of mathematics and physics using the problem solving process,
6. be able to apply logical processing to a problem and develop *and implement* algorithmic solutions,
7. know and be able to apply the engineering design process,
8. be able to create and interpret technical sketches and drawings,
9. be able to use computer applications, including graphical programming, *Matlab*, spreadsheet, word processing, and presentation software,
10. be able to use a CAD tool to generate 2D drawings.

Topics Covered:

Topic	Course Goal	Program Outcomes	# Lec/Lab (approx.)
What is engineering	1,3	h,i	1
Solution Presentation, Teaming, Ethics, Design	1,2,4,5,6,0	a-l	8
Programming, Algorithm Development, Robolab, Matlab	6,9	a,b,c,e,k	12
Engineering Fundamentals	5,6,7,9	a,b,e,g,h	24
Units, conversions, statistics, graphical analysis, complex algebra, universal accounting equation, conservation of mass, energy, and charge, basic thermodynamic concepts, economy			
Engineering Graphics	8,10	g,k	5
2D/3D visualization, dimensioning, working drawings, CAD			
Projects	4-9	a-e,g,k	3
Exams	1-10	a-k	3

Academic Honesty:

Cheating, plagiarism (submitting another person's materials or ideas as one's own), or doing work for another person who will receive academic credit are all-impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the student's own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.

Students with Disabilities Policy:

It is the policy of Tarleton State University to comply with the Americans with Disabilities Act (ADA) and other federal, state, and local laws relative to the provision of disability services. Students with disabilities attending Tarleton State University may contact the Office of Disability Services at (254) 968-9478 to request appropriate accommodation. Furthermore, formal accommodation requests cannot be made until the student has been officially admitted to Tarleton State University.

Contribution of Course to Meeting the Professional Requirement:

Math/Science Topics: 25%

Engineering Topics: 75%

Status of Continuous Improvement Review of this Course:

Revised by: *Denise Martinez*

Date: *Aug. 27, 2007*

Reviewed by: *Beth Jones*

Date: *Aug. 27, 2007*