

ENGR 1123 Foundations of Engineering II

Credit Hours: 3

Department: Mathematics, Physics and Engineering

Required or Elective (circle one)

Current Catalog Description:

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.

Course Schedule:

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

Textbook(s):

Coordinator:

Dr. Denise Martinez

Course Web Page:

Prerequisites by Topic:

Engr 111-3 – Foundations of Engineering I

Math 120-4 – Calculus I (co-requisite)

Phys 122-4 – Physics I (co-requisite)

Course Grading:

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. know the fundamental principles and canons of the Code of Ethics and understand the responsibilities of an engineer.
2. have developed skills to communicate and work effectively in teams
3. know and be able to apply fundamental engineering concepts to the problem solving process,
4. know and be able to apply the engineering design process,
5. understand and apply conservation principles to solve a problem,
6. be able to create and interpret technical sketches and drawings,

7. be able to use computer applications, including graphical programming, spreadsheet, word processing, and presentation software,
8. be able to use CAD tools to generate solid models.

Topics Covered:

Topic	Course Goal	Program Outcomes	# Lec/Lab (approx.)
What is engineering	1,3	h,i	1
Teaming Skills	1,4	d,g	1
Engineering Ethics	2,	f,h	2
Engineering Disasters, Planetarium	2,	f,h,j	2
Problem Solving and Presentation	4,5,	a,e,g	1
Engineering Design	6,	a-g	2
Programming, Algorithm Development, Robolab, Matlab	6,9	a,b,c,k	8
Data Representation: Tables and graphs	4,5,9	a,b,g,k	2
Engineering Fundamentals Units, conversions, statistics, graphical analysis, complex algebra, mechanics, trusses, universal accounting equation, conservation of mass, energy, and charge, basic thermodynamic concepts	5,6,7,9	a,b,e,g,h	24
Engineering Graphics 2D/3D visualization, dimensioning, working drawings, solid modeling, CAD	8,10	g,k	4
Project 1	4-9	a-e,g,k	3
Project 2	4-10	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 and Basic Sciences: 50%, Engineering Topics: 50%, General Education: 0%, Other: 0%

Status of Continuous Improvement Review of this Course:

Prepared by: Denise Martinez

Date: May 1, 2004

Reviewed by: Denise Martinez (for Thermodynamics and Statics and Dynamics)

Date: May 1, 2005

Reviewed by: EPOC

Date: March 20, 2009

Comments: *updated course description with minor revisions to reflect incorporation of programming and a reduction in the emphasis on visualization; based on advisory board and graduate feedback regarding the need for Matlab or other programming/algorithm skills.*