**ENGR 1120 Engineering Graphics and Design**

**Biological and Agricultural Engineering Department**

**Spring Semester, 2009**

**Instructor** **Hillary Smith Tanner**
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**Class Times** Monday, Wednesday – 12:20 pm – 2:30 pm (Rm 219)
AND Wednesday 2:30 pm – 3:30 pm (Rm 219)

| Offered | Credits | Level | Weekly Class Meeting Pattern |
|---|---|---|---|
| Fall, Spring, Summer | 3 | Undergrad | 2 - 2 hr. lab classes<br>1 - 1 hour lecture |

## Course Pre- or Co-requisites

MATH 2200 – Analytic Geometry and Calculus

OR

MATH 2250 – Calculus for Science and Engineering Students

## Courses that Require this Course as a Prerequisite

ENGR 2120 – Statics
ENGR 2920 – Engineering Design Project
ENGR 3120 – Spatial Data Analysis

## Required Supplies

Required Text Book: **Fundamentals of Graphics Communication**, 5th Ed., Gary R. Bertoline & Eric N. Weiebe

Scale: **Architect Scale** – available at UGA Bookstore, Athens Blueprint, and office supply stores

Storage: Removable USB storage, UGA file storage (U Drive)

## WebCT and Email Requirement

This class will utilize WebCT for assignments and various other communications. Students are **required** to keep up with new postings on WebCT and are **encouraged to check for updates daily**. Communication with the course participants will also be done using **username@uga.edu email (or your preferred email – make sure you tell me if it's not UGA mail) NOT** WebCT mail. Email may be used to give assignments and make announcements. Students are required to complete any assignments given using email and WebCT.

## Overview of Course

Monday and Wednesday two period classes will be primarily instruction in engineering graphics communication. This portion of the class will be time intensive with one graphics project assigned every one to two weeks. While a portion of Monday and Wednesday class time will be taken up with lecture and discussion, the primary means of instruction will be through personal interaction while you work on assignments in class. The primary objectives in this portion of the course are:

1. Develop 2-D and 3-D graphics communication skills using AutoCAD 2008
2. Develop fundamental skills pertaining to neatness, clarity, and attention to detail
3. Understand the use of working drawings and develop a set of them as part of a final project
4. Understand the concurrent engineering design process and use it in your final group project.

Wednesday afternoon classes will be a mix of guest speakers, lectures, and activities introducing the engineering design process. The engineering design process will be reviewed and practiced through a term project, which will include the application of engineering principles and graphics communication.

## Class Attendance

Attending class regularly is essential. The responsibility of promptly making up work missed on account of absences rests entirely with the student. Be forewarned that each class is built on material covered in the previous class, so you may find yourself lost as a result of an absence. In addition, if you are late for class, you may find yourself unable to catch up, so be in class on time.

***Any student who incurs 4 or more absences may be withdrawn from the class at the discretion of the instructor.***

## Academic Honesty

The University of Georgia seeks to promote and ensure academic honesty and personal integrity among students and other members of the University Community. All academic work must meet the standards contained in "A Culture of Honesty." Students are responsible for informing themselves about these standards before performing any academic work. The link to more detailed information about academic honesty can be found at:
http://www.uga.edu/honesty

Suspected violations of the University's Academic Honesty policy will be sent directly to the Office of the Vice President for Instruction, who will handle facilitation between the instructor and the student to resolve the situation.
http://www.uga.edu/honesty/ahf/ahf.htm

All work in ENGR 1120 should be done INDIVIDUALLY, unless otherwise specified by the instructor.

## Engineering Professionalism Policy

Engineers make great contributions to society. Engineering is a very satisfying profession that provides many rewards but is demanding and requires hard work. The engineering profession is governed by a code of ethics. Engineering faculty at UGA expect students to act in a professional manner at all times and develop the work ethics required for a successful engineering career. Engineering students at UGA are responsible for maintaining the highest standards of professionalism and professional practice.

## Out of the Classroom Meetings with Instructor

Meetings with the course instructor can be arranged as needed. In order to develop professional skills, **students are required to contact the instructor by telephone, email, or during class meetings to set a date and time for meetings**. If an appointment must be cancelled, the instructor must be notified in a reasonable amount of time. Unscheduled meetings are discouraged. **It is your responsibility to seek assistance if you are experiencing trouble understanding the materials presented in this course.**

## Grade Determination

This course will consist of homework/projects, exams, and a term project. Students will be graded on their professional attitude, knowledge of engineering, knowledge of engineering graphics, engineering methodology and communication skills.

The grades are based on the following scale.

1) A shows maximum effort and high level of skills for a first year student
2) B to A- shows very high level of effort and above average skills for a first year student
3) C to B- shows a good effort and average skills for a first year student
4) D to C- shows below average effort and below average skills for a first year student
5) F shows unacceptable work

A = 90 and above (4.0 gpa)
A- = 88-89.4 (3.7 gpa)
B+ = 86-87.4 (3.3 gpa)
B = 80-85.4 (3.0 gpa)
B- = 78-79.4 (2.7 gpa)
C+ = 76-77.4 (2.3 gpa)
C = 70-75.4 (2.0 gpa)
C- = 68-69.4 (1.7 gpa)
D = 60-67.4 (1.0 gpa)
F = Below 60 (0 gpa)

The following is the grade distribution for this course:

- ***30% Graphics Projects, Practical Application Exercises* and In-class Participation***
- ***45% Exams*****
- ***25% Term Project (and related assignments)***

**Note: Some projects/exercises may be worth more toward the 30% than others.*
***Note: Some exams may be worth more toward the 45% than others.*

## Departmental Grading Policy Regarding Communication Skills

Thirty percent of the grade on all written assignments (lab reports and papers) and oral presentations will be based on quality of communication. Spelling, grammar, punctuation, and clarity of writing are evidence of written communication quality. Enunciation, voice projection, clarity and logical order of the presentation and effective use of visual aids are evidence of oral communication quality.

## Submitted Work

Projects and Exams will be used to reinforce material presented in lecture and material presented by other means such as reading assignments.

All work is to be DONE INDIVIDUALLY unless otherwise specified by the instructor(s). Typed reports and machine drawings prepared by AutoCAD are expected, unless otherwise instructed.

The process for submitting assignments and exams will be discussed in class.

Graphics Exams: Graphics Exams will be the primary means of reinforcing material covered in class and in graphics projects. If you are not in class when an exam is given, you will receive a ZERO for that exam. If you arrive to class late the day an exam is given, you will not be given extra time to make up for tardiness.

Graphics Projects: Graphics projects will be given as practice for techniques introduced in class. They will be graded primarily on effort...meaning, if you turn in all drawings in a complete form that are generally correct, you will get full credit, although major errors will result in less credit. An incomplete project will receive credit accordingly. If you fail to submit a project, you will receive a zero. Graphics projects must be turned in at the appointed time the day they are due to be considered for full credit.

In-class projects: In-class projects are to be turned in at the end of class the day they are assigned. Failure to do so will result in a ZERO.

**NO LATE EXAMS, PROJECTS OR ASSIGNMENTS WILL BE ACCEPTED**

## The Term Project

A term project will be used to demonstrate the use of basic engineering problem solving skills to develop a product. Prototyping will be an integral part of the term project. Both a prototype demonstration (AutoCAD working drawings) and written communication of the solution will be used to determine the grade of the term project.

**The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.**

## Course Learning Objectives Matrix

| Course Learning Objectives | Course Assessment Methods | Extent of Coverage of Program Outcomes (ABET Criterion 3) | | |
|---|---|---|---|---|
| Upon successful completion of this course the student will be able to | | | | |
| 1. Develop an understanding of the engineering discipline | A,C,D | a-x<br>b-x<br>c-x | e-x | |
| 2. Understand the need for engineering and mathematical sciences in engineering | A,D | a-x<br>b-x<br>e-x | | |
| 3. Develop quantitative design criteria | A,D | a-x<br>b-x<br>c-x | d-x<br>k-x | |
| 4. Develop creative thinking skills and formulation of conceptual solutions | A,D | a-x<br>b-x<br>c-x<br>d-x | e-x<br>f-x<br>g-x<br>h-x | k-x |
| 5. Instill logical steps of conceptual design evaluation | A,D | a-x<br>c-x<br>d-x | g-x<br>h-x<br>k-x | |
| 6. Reinforce the value of communication skills | A,D | d-x<br>g-x | | |
| 7. Instill an understanding the need to engage in life-long learning | D | c-x<br>f-x | i-x | |
| 8. Visualize and construct 2-dimensional drawings to scale | A,B,C,D,E | a-xx<br>e-x<br>g-xxx | k-x | |
| 9. Construct and determine appropriate view selections for multiview orthographic projections to scale | A,B,C,D,E | a-xx<br>g-xxx | | |
| 10. Visualize and draw in 3-dimensional space | A,B,C,D,E | a-xx<br>e-x<br>g-xxx | k-xx | |
| 11. Generate 2-d orthographic projections from 3-d solids | A,C,D,E | a-x<br>g-xxx<br>k-xxx | | |
| 12. Read and develop working drawings | A,C,D,E | e-x<br>f-x<br>g-xxx | i-xx<br>k-xxx | |
| 13. Link the engineering design process and computer based graphic design | A,D,E | a-x<br>c-xxx<br>d-xxx | e-xxx<br>h-x<br>j-x | k-x |
| 14. Use ANSI standards and conventions in generating engineering drawings | A,B,C,D,E | f-xx<br>g-xxx<br>k-xxx | | |

Course Assessment Methods:
A-Projects, B-Midterm Exam, C-Final Exam, D-Term Project, E-Student Evaluation

ABET EC-2000 Criterion 3 Program Outcomes

a – an ability to apply knowledge of mathematics, physical, biological, and engineering sciences
b – an ability to design and conduct experiments, as well as analyze and interpret data
c – an ability to design a system, component, or process to meet desired needs
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 and societal context
i – A recognition of the need for, and an 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

## Course Learning Objectives Matrix

| Course Learning Objectives | Course Assessment Methods* | Extent of Coverage of Program Outcomes** (ABET Criterion 3) |
|---|---|---|
| Upon successful completion of this course, the student will be able to: | | |
| Visualize and Construct 2-dimensional drawings to scale | A, B, C, D, E | a - xx<br>e - x<br>g - xxx<br>k - x |
| Construct and determine appropriate view selections for multiview orthographic projections to scale | A, B, C, D, E | a - xx<br>g - xxx |
| Visualize and Draw in 3-dimensional space | A, B, C, D, E | a - xx<br>e - x<br>g - xxx<br>k - xx |
| Generate 2-d orthographic projections from 3-d solids | A, C, D, E | a - x<br>g - xxx<br>k - xxx |
| Read and Develop a Set of Working Drawings Through a Group Final Project | A, C, D, E, F | e - x<br>f - x<br>g - xxx<br>i - xx<br>k - xxx |
| Use ANSI standards and conventions in generating engineering drawings | A, B, C, D, E | f - xx<br>g - xxx<br>k - xxx |

* Course Assessment Methods: A – Projects; B – Mid-Term Exam; C – Final Exam; D – Final Project; E – Student Evaluation, F – Conference Presentations
** Extent of Coverage: x – some, xx – moderate, xxx - extensive

## ABET EC-2000 Criterion 3 Program Outcomes

a) An ability to apply knowledge of mathematics, science, and engineering
b) An ability to design and conduct experiments, as well as to analyze and interpret data
c) An ability to design a system, component, or process to meet desired needs
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 educational necessary to understand the impact of engineering solutions in a global and societal context
i) A recognition of the need for, and an 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.

## Overall Course Contribution to Program Outcomes

a-some
e-some
f-some
i-some
g-extensive
k-extensive

## Revision

October 2008