
DEPARTMENT OF MECHANICAL ENGINEERING
THE UNIVERSITY OF TEXAS – PAN AMERICAN

INSTRUCTOR: Dr. Seokyoung Ahn

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Web Folder: <http://crown.panam.edu/EG>

OFFICE HOURS: 2:00-4:00 pm MW
9:00-10:45 am F
or by appointment

TEXTBOOK: *Fundamentals of Graphics Communication, 5/e*, Gary Bertoline et al. 2007
McGraw-Hill Higher Education (Required)

COURSE DESCRIPTIONS:

An introduction to computer-aided drafting techniques using a CAD program and sketching to generate two and three dimensional drawings based on the conventions of engineering graphical communication. A required design project introduces the need for analysis, working drawings, and consideration of production methods.

CLASS SCHEDULE: M 9:45 -10:35 pm. at SCIE 2.108
Lab. Section A: W 2:35-5:05 pm at ENGR 2.268
Section B: F 1:10-3:40 pm at ENGR 2.268
Section C: F 4:00-6:30 pm at ENGR 2.268

CLASS OBJECTIVES:

- To have the basic skills needed to interpret and create engineering drawings following the standard conventions of engineering graphical communication.
- To be able to quickly generate multiview and pictorial sketches to aid in the ideation phase of the design process.
- To be proficient in the use of CAD software for generating 2-D and 3-D working drawings and solid model drawings for use in other programs.
- To be able to use sketches and CAD software as an integral tool in the design process and be able to persuasively present a design using generated drawings and computer models in a comprehensive design presentation.
- Individual objectives for each lecture are given in the lecture notes.

REQUIRED SUPPLIES:

In addition to the textbook, a number of supplies listed below are needed for lab.

- A removable media storage device such as a USB flash drive that can hold at least 512 Mb.
- Inexpensive Drawing/Drafting Kit with compass/divider, triangles, divider, ruler, and protractor.
- 3-hole binder, blank paper, pencil, and eraser.
- Headphones with mini-jack and 5' cord.
- Pocket folder for turning in printed homework.
- Pan-Am E-Mail account to log onto laboratory computers
- Microphone needed for Final Project.

WEB SITE:

The Engineering Graphics web site (<http://crown.panam.edu/EG>) contains complete lecture presentation slides for many of the lectures, tutorial movies for homework assignments, practice quizzes, and games related to the lecture material.

EXAMS:

Hour exams will be given during the lab period in the computer lab and the final exam will be given in the lecture hall.

- 1st Hour exam 9/28. (10% of your total grade)
The exam covers lectures 1-4 and homework assignments 1-4.
- 2nd Hour exam 10/28, 10/30. (10% of your total grade)
The exam covers lectures 5-8 and homework assignments 5-8.
- 3rd Hour exam 11/23, 11/24. (10% of your total grade)
The exam covers lectures 9-12 and homework assignments 9-12.
- Final Exam given during the scheduled final exam time (8:00 – 9:45 am, Friday, Dec. 18). (25% of your total grade)
The final exam will cover all lecture and lab material.
- The Design Project is due at 12:00 pm on the first week of lab session and class presentations will begin at that time in the lab session.

Quizzes: A quiz will be given at the end of each lab period. Quizzes may cover the lecture material and may require you to use the CAD software and drawing skills that you develop during lab. The best way to prepare for a quiz is to review the lecture notes prior to lab and to make an effort to complete the homework assignment during the lab period. Quizzes are worth 10% of your total grade.

Homework: All assignments are due at the **beginning of lab** (first 10 minutes) on the given due dates. You may turn in any portion of a homework assignment and receive partial credit. Homework is worth 20% of the total grade. All electronic homework submissions must be uploaded during the first 10 minutes of lab. It is advised that you keep a copy of all homework on a personal flash drive.

Design Project: The design project is a group project, however each member is responsible for the entire project. Progress of the project will be checked throughout the semester, however the project must be submitted in full at the time of your scheduled group presentation. If members of the group become inactive or drop the course, remaining members will be held responsible for the entire project. It is recommended that each group member retain copies of all design project work to date. The submitted project will consist of the following: working drawings of each individual part, a computer solid model of the design, a report describing the design project, and a 7-10 minute media presentation of the project. The design project is worth 15% of the total grade.

Policy on attendance, academic integrity, etc. will follow the Mechanical Engineering Department Classroom Policies

LECTURE MATERIAL

#	Lecture Topic	Suggested Reading Assignment
1	The Engineering Design Process	Chapter 1.1-1.13, 11.1-11.9
2	Sketching and Engineering Graphics	Chapter 2, 5.1-5.3, 5.13
3	Multiview Drawings	Chapter 5.4-5.7, 5.13
4	Pictorial Drawings	Chapter 7
5	Solid Modeling	Chapter 4, 5.10-5.12
6	Geometry and Constraints	Chapter 3
7	Auxiliary Views	Chapter 6
8	Section Views	Chapter 8.1-8.4
9	Dimensioning	Chapter 9.1-9.4
10	Tolerancing	Chapter 9.5-9.7
11	Standard Conventions	Chapter 5.8-5.9, 8.5
12	Working Drawings	Chapter 10.1-10.2
13	Technical Presentations	No Reading Assignment
14	Symbols and Schematics	Chapter 10.3-10.10
15	Data Presentation	Chapter 4.5

The above reading assignments are for the text by Bertoline, *Fundamentals of Graphics Communication, 5th ed.*

Mechanical Engineering Department Classroom Policies

Attendance:

1. Attendance will be taken every time the class meets. Any student arriving to class **5 minutes** after the class has started will not be allowed in class. Students will be allowed a **maximum** of 5 absences for the whole semester for classes meeting three times a week, 3 absences for classes meeting twice a week, and 2 absences for classes meeting once a week. A **point** will be deducted from the total (100%) for each **unexcused** absence exceeding the maximum allowable.
2. Students **will not** be permitted to leave the classroom during lectures and exams except for **extreme emergencies**.

Homework and Exams:

1. **Absolutely** no assignments will be accepted late.
2. Make-ups for in-class exams for **extreme emergencies** will be scheduled at the end of the semester.

Plagiarism:

Any instance of cheating or plagiarism will result in **loss of credit** for the work, and will be reported to the Chair of the ME Department and/or the Dean of Students for appropriate action which may include **loss of credit** for the course or **dismissal** from the University.

Drop Policy:

Students can withdraw from a course through the *Office of Records and Registration* on or prior to:

- September 16, 2009, Wednesday,
 - 1. Twelfth class day (Official Census Date).
 - 2. **Last day to receive 100 percent refund for “dropped” classes.** The student must remain enrolled in one course in order to receive 100 percent refund for the dropped course(s).
- September 29, 2009, Tuesday,
 - Last day to change course to Non-credit.
- November 12, 2009, Thursday,
 - Last day to drop a course or withdraw from the University. After this date student remains enrolled in course(s) and receives whatever letter grade(s) he/she earns.

American Disabilities Act Statement:

If you have a documented disability which will make it difficult for you to carry out the work as I have outlined and/or if you need special accommodations/assistance due to the disability, please contact the Office of Service for Persons with Disabilities (OSPD), Emilia Schunior-Ramirez Hall, Rm. 1.101, Tel. 316-7005, immediately. Appropriate arrangements or accommodations can be made.

Mechanical Engineering Department Outcomes (Outcomes in bold are addressed by this course.)

Students shall demonstrate that they are able to:

1. **use knowledge of mathematics, basic sciences, and engineering to analyze (identify, formulate, and solve) problems in mechanical engineering;**
2. design and conduct experiments and interpret results;
3. **design mechanical devices, systems, or processes that meet given specifications;**
4. **function in multidisciplinary teams;**

5. communicate ideas effectively in graphical, oral, and written media;

6. understand the professional responsibility of an engineer and how engineering solutions impact safety, economic, ethical, political, societal, cultural, and contemporary issues;

7. understand the need for life long learning to keep abreast of current practice; and

8. use state of the art computational hardware and software for analysis, design and documentation (techniques, skills, and modern engineering tools necessary for engineering practice).

Science and Mathematics Outcomes (Outcomes in bold are addressed by this course.) Students shall demonstrate that they have

S1. knowledge of chemistry and calculus-based physics with depth in at least one;

S2. the ability to apply advanced mathematics to problems involving thermal and mechanical systems; and

S3. the ability to apply statistics and linear algebra to problems involving thermal and mechanical systems.

Engineering Outcomes (Outcomes in bold are addressed by this course.) Students shall demonstrate that they have the ability to

E1. create and annotate two-dimensional drawings, and generate three-dimensional computer based solid models of mechanical components;

E2. design and analyze components and systems for mechanical and energy performance;

E3. specify and evaluate materials and manufacturing steps for mechanical components;

E4. conceive and conduct experiments to measure the performance of materials, components and systems, and to communicate the results; and

E5. acquire new skills and specialized knowledge from published sources

Course Outcomes (Key: H-Homework, P-Project, Q-Quiz, T-Test) Students will be able to:

1. Explain a six-step design process and the role of drawings in each step (T)

2. Use and define basic terminology used in engineering graphics

3. Write a problem statement given information about a design project (H,P,T)

4. Work with other students to complete a design project (H,P)

5. Make a PowerPoint presentation that integrates CAD drawings and animation (P)

6. Quickly create multiview sketches from pictorial drawings (H,Q,T)

7. Quickly create isometric and oblique pictorial sketches from multiview drawings (H,Q,T)

8. Formulate ideas and create sketches for a design project (P)

9. Create pictorial and multiview drawings in Pro-E (H,P,Q,T)

10. Understand the methodology for perspective sketching (T)

11. Understand a 3-D coordinate space and the right-hand rule (H,Q,T)

12. Convert between Cartesian and spherical coordinate systems (H,T)

13. Use CAD tools to create drawings constrained by geometry (H,Q,T)

14. Understand standard conventions associated with multiview drawings (H,T)

15. Use descriptive geometry tools to identify true length and true shape features (H,Q,T)

16. Generate primary and secondary auxiliary views in sketches and CAD drawings (H,Q,T)

17. Generate several types of section drawings and understand conventions (H,Q,T)

18. Interpret and generate dimensioned drawings following standard conventions (H,P,Q,T)

19. Understand tolerance of size and concept of geometric tolerancing (H,Q,T)

20. Generate and post CAD models for presentation and visualization (H,P,Q,T)

Assessments Key: H–homework, T–test. Both assessment instruments will be used to evaluate the success of the prescribed “Course Outcomes” (homework or tests) and the corresponding Departmental, Science and Math, and Engineering outcomes.

	1	2	3	4	5	6	7	8	S1	S2	S3	E1	E2	E3	E4	E5
1	x				x		x									
2																x
3	x				x											
4	x		x	x									x			
5					x			x				x				
6					x							x				
7					x							x				
8	x		x		x							x	x			
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17	x				x							x				
18	x				x							x		x		
19	x											x		x		
20	x		x		x			x				x				