

# Engr 1304: Engineering Graphics & Design

Lecture on TTh 2:30 pm – 3:25 pm, Lab on TTh 3:35 – 5:00 pm  
Science Building, Room 116 and 131

## Syllabus – Fall 2010

Instructor: Dr. April K. Andreas  
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Department Website: <http://www.mcclennan.edu/departments/engr/>  
Course Website: <http://www.cleverfred.com/mcc/>

**Course Description:** Introduction to computer-aided drafting using CAD software and sketching to generate two- and three-dimensional drawings based on the conventions of engineering graphical communication; topics include spatial relationships, multi-view projections and sectioning, dimensioning, graphical presentation of data, and fundamentals of computer graphics. Semester hours 3 (2 lec, 3 lab)

**Prerequisites:** Students must have completed Math 1314 or have consent of division director.

**Learning Outcomes:** Upon successful completion of this course, the student will be able to demonstrate the following learning outcomes:

1. Discuss the basic steps in the design process.
2. Demonstrate proficiency in freehand sketching.
3. Demonstrated proficiency in geometric modeling and computer aided drafting and design (CADD).
4. Communicate design solutions through sketching and computer graphics software using standard graphical representation methods.
5. Solve problems using graphical geometry, projection theory, visualization methods, pictorial sketching, and geometric (solid) modeling techniques.
6. Demonstrate proper documentation and data reporting practices.
7. Complete a project involving creation of 3D rapid prototype models.
8. Function as part of a design team as a team leader and as a team member.

### Required Text & Material:

Required:

- ENGR 1304: Engineering Graphics and Design, McLennan Community College  
Pearson Custom Publishing ISBN: 978-0-558-61030-2 or 0-558-61030-7
- Engineering Design with SolidWorks 2010, by Planchard and Planchard  
SDC Publications ISBN: 978-1-58503-572-4  
*This book should come with two additional prepackaged items:*
  - A Student Design Kit (SDK)
  - A MultiMedia CD
- Flash drive or other method for storing and transporting files

- *Pencil* and eraser (“Magic Rub” erasers are the best I’ve ever seen)

Optional:

- Schaum's Outline of Mathematical Handbook of Formulas and Tables, 3ed  
McGraw-Hill  
ISBN: 978-0071548557 or 0071548556
- Headphones (for during some labs, not during lecture!)

**Additional requirements:** Student must have a reliable computer and internet connection. Students must be able to demonstrate basic computer literacy skills such as keyboarding, sending and receiving email, and using a web browser.

**Office Hours:** Unless announced otherwise, my office hours will be MW 12:00 pm – 1 pm and TTH 9:00 am – 10:30 am. You can also make an appointment to meet with me at another particular time, and are also welcome to drop by my office without an appointment.

**Learning Lab:** The Learning Lab in the Science Building, room 135, has five computers with SolidWorks installed for student use. Learning Lab hours will be posted on the door. Students in this class may contact Liz Mitchell at 299-8187 or [emitchell@mclennan.edu](mailto:emitchell@mclennan.edu) to make an appointment to get into the lab outside of regular hours. Note: The MCC Computer Lab will not have SolidWorks available. Students who do not purchase either the bookstore’s edition of the SolidWorks book (which comes with a Student Design Kit) or their own copy of SolidWorks will need to go to the Science Building’s Learning Lab to complete assignments.

**Attendance:** Attendance is mandatory. You must attend both lecture and lab. For simplicity, the period from 2:30 pm to 5 pm will be called “class,” regardless of how it’s broken up. Per MCC policy, you will be automatically dropped after missing 25% of class meetings, **or 8 classes**. For this purpose, arriving late and leaving early both count as half an absence. If you are dropped before the official drop date, you will receive a grade of W. If you are dropped after the official drop date, you will receive a grade of F, unless there are highly unusual circumstances.

MCC allows for “excused” absences caused by (1) authorized participation in official College functions, (2) personal illness, (3) an illness or a death in the immediate family, or (4) the observance of a religious holy day. It is your responsibility to let me know the reason for an absence the day you return to campus and provide sufficient documentation (doctor’s note, email from coach, etc.).

**ADA Statement:** “In accordance with the requirements of the Americans with Disabilities Act (ADA), and the regulations published by the United States Department of Justice 28 C.F.R. 35.107(a), MCC’s designated ADA co-coordinators, Mr. Gene Gooch - Vice President, Finance and Administration and Dr. Santos Martinez – Vice President, Student Services shall be responsible for coordinating the College’s efforts to comply with and carry out its responsibilities under ADA. Students with disabilities requiring physical, classroom, or testing accommodations should contact Mr. Marcus Sweatt, Disabilities Specialist, at 299-8122 or [msweatt@mclennan.edu](mailto:msweatt@mclennan.edu).”

**Six Drop Rule:** Students who enroll at MCC as entering freshman or first-time college students during the fall 2007 semester or any subsequent semester may not drop more than six courses. The six-course limit does not apply to students who were enrolled in college courses prior to the fall 2007 semester. Students who have completed a baccalaureate degree at any accredited public or private institution are not subject to the six-course limit. The six –course limit includes courses taken at MCC or any other Texas public institution of higher education. If a seventh drop is attempted, the student and instructor will be informed that the student must remain in the course and the student will receive a grade of A, B, C, D, F or 1. He/she will not be able to receive a W or withdrawal grade and will not be due a refund of tuition and fees. All courses dropped after the semester census date are included in the six-course limit unless (1) the student withdraws from all courses or (2) the drop is an approved drop exemption.

**Academic Integrity:** Do not share your files with others in the class. Do not let someone “borrow” your flash drive. It is reasonably easy to tell if two people have the exact same file. If someone else turns in your file, you will both be penalized. Any student that is found guilty of academic dishonesty such as cheating, plagiarism, or collusion, will receive the zero grade on every test or assignment involved. For repeated violations, a guilty student can be assigned a failing grade in this course and can be recommended for suspension from the McLennan Community College District.

**Privacy:** Because of Privacy Laws, I can only discuss your grade with you, in person and in private. I can only discuss grades by e-mail if you e-mail me with your university address.

**Miscellaneous:**

- Your success in this class depends on you keeping up with assignments. Once you fall behind, you’re going to be in significant academic pain.
- I know there’s a pretty, shiny computer that’s going to be sitting in front of you constantly. That said, please stay on track to whatever we’re doing in class. If we’re working on a project from the book, that’s what you should be doing. If we’re working on the design challenges, you should be, too. If we’re going through lecture, your monitors should be off.
- You shouldn’t be working on homework or anything else during lab time unless you’re done with the current lab assignment.
- In case the school has to close due to inclement weather, please visit the school website for up to date official information at <http://www.mclennan.edu/>.
- Normally, please do not bring your children, friends, or guests to the class. (Please discuss this with me because I do not want you missing class if you cannot make child care arrangements.)

**Makeup Policy and Late Assignments.** Late assignments will not be accepted. Since most all assignments and due dates are already posted for the entire semester, even if you get sick the day before it is due, you still must have it in on time. If you are legitimately ill for a week or more at a time (with documentation from a doctor’s office), I will do what I can do work with you. If you have to miss class on the day that an assignment is due for either a college event or religious holiday, you must turn in the assignment early.

If you are legitimately ill during an in-class assessment, you must email me the morning of the exam or presentation (before you miss it), and provide a doctor’s note the first day you are back in class in order to receive consideration for a makeup exam.

## Grading Policy

Grade Distribution	
Homework	25%
Lab Checks	10%
Design Challenge: Leader	10%
Design Challenge: Member	20%
Test 1 and 2	15%
Final	20%
<b>Total</b>	<b>100%</b>

**A** 90-100%

**B** 80-89%

**C** 70-79%

**D** 60-69%

**F** 0-59%

**Homework:** Homework must be in by 2:30 pm on the day it is due *whether or not you are in class that day*. Specific problems will be posted on Blackboard, along with additional requirements.

Date	Due	Submission
Sep 2	HW 1: Chapters 1 – 3	(on paper)
Sep 16	HW 2: Chapters 4 – 5	(on paper)
Oct 5	HW 3: Project 1 Exercises	(electronically)
Oct 19	HW 4: Project 2 Exercises	(electronically)
Oct 28	HW 5: Project 3 Exercises	(electronically)
Nov 16	HW 6: Project 4 Exercises	(electronically)
Nov 30	HW 7: Project 5 Exercises	(electronically)

**Lab Checks:** Each day, there will be a certain step to get to in the design process. If you don't finish during lab time, you'll need to finish independently so you don't fall behind. You must submit any relevant files to me before the beginning of the next class period. To simplify things, these will be graded pass/fail.

- If you are at or beyond the required step, you get a grade of 100%. (If I notice any minor errors, I won't count off, but will try to alert you to them so you can fix them as you continue the project.)
- If you are not at the required step, if there are major omissions in your progress, or if don't turn in your files on time, you get a grade of 0%.

Note that, "I missed lab last time because it was raining and I didn't want to get wet so I'm behind" isn't a legitimate excuse for not turning in your lab check. We're covering too much each day for you to get behind. I want you to learn the material and pass this class, and the only way to do that is to do everything I can to keep you motivated to stay caught up.

**Design Challenges:** One critical requirement for this course is for you to function as both a leader and team member during group design. You will be assigned groups of around three or four people and given a small amount of time to work on these design challenges in class. All other work must happen outside of class.

Each team will select a leader for each design challenge. **Every person must serve as a leader at least once.** In each challenge, the leader will

- Be responsible for making sure everyone in the team works on the challenge
- Be ultimately responsible for making sure the challenge gets done
- Keep meeting minutes and turn them in with other required documents
- Communicate the final design in a formal presentation

If you are having trouble with your team, please talk to me immediately. More details on this and other matters will be given in each Design Challenge description. Grading criteria for each Design Challenge will vary by challenge.

There are two grading categories related to this type of work:

- **Design Challenge: Leader (10%):** The grade earned by your team on the design challenge where you served as leader. (If you end up serving as leader more than once, I will use an average of the leader scores.)
- **Design Challenge: Member (20%):** The average score earned on all four design challenges.

Date	Presentation Due
Sep 28	Design Challenge 1 Presentation
Oct 14	Design Challenge 2 Presentation
Nov 2	Design Challenge 3 Presentation
Nov 18	Design Challenge 4 Presentation

**Tests:** There will be two paper-based tests at the beginning of the semester, testing you on essential drawing skills. These are closed-book, closed notes. You must complete these tests during lecture time. Lab time will be spent on other matters.

Date	Test
Sep 9	Test on Chapters 1 – 3
Sep 21	Test on Chapters 4 – 5

**Final Exam:** The final exam will be **Thursday, December 9, 2:30 pm – 4:30 pm**. There will be an in-class portion and a take-home portion. Details will be announced as the date nears. The take-home portion will emphasize the skills you will have learned in SolidWorks, and the in-class portion will be comprehensive.

## Tentative Lecture Schedule

*Below is an initial sketch of when we will cover material and when tests will be scheduled.  
It is your responsibility to attend class so you will know of any changes to this schedule,  
including any changes in test dates.*

<b>Date</b>	<b>Lecture</b>	<b>Lab</b>
Tue, Aug 24	Syllabus, Chapters 1 & 2	Continue lecture, work on p. 20 #1,2,3
Thu, Aug 26	Chapter 3	Work on p. 33+ #1, 2, 4, 5
Tue, Aug 31	Chapter 3	Work on p. 33+ #3, 6, 7, 8, 9
Thu, Sep 2	Chapter 4	Work on p. 44+ #2, 3, 4, 5
Tue, Sep 7	Chapter 5	Work on p. 61+ #3, 4
<b>Thu, Sep 9</b>	<b>Test on Chapters 1 - 3</b>	Intro to Design Process, Start Work on Design Challenge 1
Tue, Sep 14	Chapter 5	Work on p. 61+ #5, 6, 7, 8
Thu, Sep 16	Project 1	Create plate part through step 240 on pg "1-64"
<b>Tue, Sep 21</b>	<b>Test on Chapters 4 - 5</b>	Instructor's Choice, Group Work on Design Challenge 1
Thu, Sep 23	Project 1	Create rod part through step 446 on pg "1-85"
<b>Tue, Sep 28</b>	<b>Design Challenge 1 Presentation</b>	Start Work on Design Challenge 2
Thu, Sep 30	Project 1	Create guide part through step 618 on pg "1-102"
Tue, Oct 5	Project 2	Begin assembly through step 271 on pg "2-46"
Thu, Oct 7	Project 2	Finish assembly through step 546 on pg "2-79"
Tue, Oct 12	Instructor's Choice	Group work on Design Challenge 2
<b>Thu, Oct 14</b>	<b>Design Challenge 2 Presentation</b>	Start Work on Design Challenge 3
Tue, Oct 19	Project 3	Begin drawing through step 217 on pg "3-36"
Thu, Oct 21	Project 3	Continue drawing through step 373 on pg "3-54"
Tue, Oct 26	Project 3	Finish drawing through step 541 on pg "3-78"
Thu, Oct 28	Instructor's Choice	Group work on Design Challenge 3
<b>Tue, Nov 2</b>	<b>Design Challenge 3 Presentation</b>	Start Work on Design Challenge 4
Thu, Nov 4	<b>Field Trip</b>	
Tue, Nov 9	Project 4	Begin drawing through step 251 on pg "4-40"
Thu, Nov 11	Finish drawing through step 668 on pg "4-82"	
Tue, Nov 16	Project 5	Group work on Design Challenge 4
<b>Thu, Nov 18</b>	<b>Design Challenge 4 Presentation</b>	Create lens cap through step 311 on pg "5-30"
Tue, Nov 23	Complete project through step 998 on pg "5-85"	
Tue, Nov 30	<b>Field Trip</b>	
Thu, Dec 2	Instructor's Choice	Review

**I reserve the right to change any term on this syllabus at any time during the semester.**