ENGR 1322 – Engineering Design with CAD
Fall 2020 SWJTU

Instructor:
Dr. Jeffrey Callicoat
219 Engineering North
OSU campus - Stillwater
jeffrey.callicoat@okstate.edu

Teaching Assistant (TA):

TA	email
Zilin Zhang (@ SWJTU)	zilzhan@okstate.edu
Calvin Wynn (@ OSU)	calvin.wynn@okstate.edu

Additional Support: CEAT Online Learning – OSU
101 Engineering North
Oklahoma State University
Stillwater, OK 74078
Phone: 405-744-5146
Email: ceatonline@okstate.edu
Website: https://ceat.okstate.edu/ceatonline/

Class Time:
Fridays 8:00-10:25am (Sept. 18 – Dec. 11), *and* Wednesdays 10:40a-12:15p (Oct. 14 – Nov. 18)
You can use this class time each week to watch the online course videos and work on your assignments. Your SWJTU TA for the course will be available during these times to assist with questions you may have as you work on your assignments, design project, or other course material. Exams will also be taken during class time, as specified in the course schedule on the last page of this syllabus.

**Class Question/Answer website:** Piazza: https://piazza.com
You will receive an email invitation to join ENGR 1322 on Piazza during the first few days of the semester. If you do not see this invitation, please look for a Canvas Announcement that contains the sign-up link. Posting questions on Piazza is the best way to get a fast answer for course-related questions that arise outside of class! The instructor and TAs will respond to posted questions as quickly as possible, and students can also answer questions for one another!

Email Contact:
To get quick answers for questions that arise throughout this course, your best resources are your SWJTU TA and/or the Piazza Q&A website. However, if you have an issue that you believe is *not* appropriate for the TA to address or for posting on Piazza, and you need to contact me on an individual basis, you can do so using my email address given above. I will do my best to respond in a timely fashion. Your emails are important to me! **To ensure that I see your email, please begin the subject line with "ENGR 1322-SWJTU".** Please be aware that I teach multiple classes, and I generally need to know *__your section (SWJTU)__* in order to provide accurate responses. Emails without this information may have significantly delayed responses.
Note: If you send me an email, I recommend sending it through Canvas or from your own OSU email account. Emails sent from qq.com email addresses often get blocked by the OSU email server!

Textbook: *Design Concepts for Engineers* by Mark N. Horenstein, 5th Edition
(Optional)   This book serves as a reference for much of the material we cover in the
                   Lecture portion of the course.
                   Additional material drawn from other sources will be provided via Canvas
                   (https://canvas.okstate.edu).
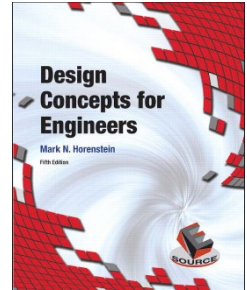
Website: https://canvas.okstate.edu [a.k.a. D2L/Online Classroom (OC)]
                   Canvas will be used for disseminating course material, assignments, quizzes,
                   grades, announcements and supplementary materials. All homework
                   assignments will be turned in using assignment dropboxes on Canvas.

Prerequisite: None

Catalog Description: Introduction to engineering design using modern design methodologies and computer-aided tools. Design, construction and testing through participation in a multidisciplinary team-based design project contest.

Course Objectives: By the end of this course, successful students should be able to demonstrate:
- Engineering design skills adequate to develop appropriate solutions for realistic problems within realistic constraints;
- Understanding of how the engineering design process is utilized to create solutions for real-world open-ended engineering problems;
- Ability to elicit and organize requirements for engineering design projects;
- Ability to develop potential solutions into prototypes;
- Proficiency in a modern computer aided design (CAD) software package (AutoCAD);
- Understanding of engineering tools required to model, analyze, and simulate engineering systems;
- Ability to effectively apply CAD skills in a design project;
- Healthy team behaviors in a design project environment, and an understanding of project management and tools for guiding project development;
- Effective communication skills to support design project work.

General Student Outcomes (ABET Outcomes):
- C: Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- D: Ability to function on multi-disciplinary teams;
- E: Ability to identify, formulate, and solve engineering problems;
- F: Understanding of professional and ethical responsibility;
- G: Ability to communicate effectively (written and oral);
- K: Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Format: The course is split into two components – a lecture and a lab. During the lecture, students learn about the design process and engineering tools. In the lab portion of the course, students learn and practice using AutoCAD computer-aided design software. Students study all course content provided through the online course Canvas website. Weekly, students review assigned lecture videos and lab videos and complete associated assignments.

Grading: Grades will be determined based on the following:

Lecture	
Syllabus Quiz	25 pts
Lecture Assignments*	100 pts total *(4 @ 25-pts each)*
Lecture Midterm Exam	75 pts
Lecture Final Exam	75 pts
Laboratory	
Lab Assignments*	250 pts total *(10 @ 25-pts each)*
Lab Exam 1	75 pts
Lab Exam 2	75 pts
Design Project	
Design Proposal	25 pts
Project Status Update	25 pts
Final Report	50 pts
Final Drawings	50 pts
Overall Total:	**825 pts**

Note: Your lowest Assignment grade (Lecture or Lab) will be dropped.

After dropping an assignment grade, the total points in the course becomes 800. Your course grade is determined by the number of points you have earned (after dropping your lowest assignment grade) out of 800. The grade ranges are as follows:

Grade Ranges	
A	85-100%
B	75-84%
C	60-74%
F	0-59%

Computing Requirements: A personal computer is required to complete this course.

Word processing and spreadsheet software may be required to complete homework assignments. Various software programs can be downloaded for free from CEAT Information Technology Services (https://ceat.okstate.edu/itservices/) and the OSU IT Software Distribution Center (https://apps.okstate.edu/sdc/) to support your course requirements.

Additionally, should you have any issues with computing, you may submit a Help Ticket to CEAT-ITS through their website (https://ceat.okstate.edu/itservices/). They will elevate the ticket to OSU IT if they do not have responsibility for addressing the concern.

Hardware and Software Requirements:
The AutoCAD software that we are using in ENGR 1322 is available for download from the CEAT ITS website (https://ceat.okstate.edu/itservices/software-downloads/free-autodesk-apps.html). Please follow the instructions to download the software. CEAT ITS is able to assist with the software download should you need assistance. You can submit a Help Ticket to CEAT ITS through their website (https://ceat.okstate.edu/itservices/), or you can contact them at 405-744-1753 or email CEAThelp@okstate.edu.

YOU WILL WANT TO RUN AUTOCAD WITH A MOUSE – USING THE TOUCH PAD MAKES IT INCREDIBLY DIFFICULT TO MANIPULATE THE SOFTWARE.

Resources: You have the following resources available to you as part of the course:

1. **AutoCAD Help –** The software has an imbedded help function through which you can search on any number of terms and obtain assistance.
2. **Online Resources –** On just about any topic, an internet search will yield discussion forums, videos, and other materials that will assist you in developing proficiency with the software.
3. **TA Assistance –** Your best resource for getting quick answers to questions in this course and for getting individual assistance with assignments is your SWJTU TA.
4. **Piazza Q&A Class Forum –** Posting course-related questions on Piazza is a good way to get a fast answer from the instructor, TA, and/or classmates
5. **CEAT IT Assistance –** CEAT-ITS can provide assistance with hardware and software issues. Visit their website at https://ceat.okstate.edu/itservices/.

If you have never previously worked with a modeling software, you will need to spend a significant amount of time in the beginning of this course in order to become acquainted with the basic software environment and mechanics. You can easily get behind since most of the labs build on one another. AutoCAD is a powerful tool, but you must invest the time to practice outside of the labs in order to develop sufficient proficiency.

Homework: Homework will be assigned for various topics and must be submitted by the stated deadline. **Please note that the due dates and times are given in China Standard Time (Beijing Time).**

Students may discuss assignment problems with classmates, but ***all work*** submitted must be original to the student. Unacknowledged content (e.g., from solution manuals or other sources) and contributions will be considered academic dishonesty and dealt with accordingly.

Homework assignments are to be submitted to the designated assignment dropbox on Canvas by the given deadline. Please note that all homework assignments have strict due dates, which will be clearly stated when the work is assigned. Due to the large size and fast pace of ENGR 1322, ***late work is not accepted.***

Exams: There will be two Lab Exams and two Lecture Exams. Exams will be closed book and closed notes. Exams missed without ***prior*** arrangement with the instructor will receive zero scores. Exams will be proctored by your SWJTU TA.

Grade Questions or Disputes: If you have questions or concerns about your grade on an assignment, exam, etc., please contact the TA grader first. (This is the OSU TA listed at the beginning of this syllabus.) If you still have questions after speaking with the TA, then it is appropriate to contact the course instructor. Grade concerns should be raised within one week of the grade being posted on Canvas.

Academic Integrity: OSU is committed to maintaining the highest standards of integrity and ethical conduct. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and altering academic records) will result in an official academic sanction. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended from the University. You have the right to appeal the charge. Please go to the Academic Integrity website (http://academicintegrity.okstate.edu) for more information.

Note: Posting any content from this course onto other internet websites (such as Chegg, Course Hero, YouTube, etc.) is considered a violation of Academic Integrity and will be handled accordingly. You may not post lecture slides, videos, assignments, quizzes, or any other course content onto outside websites

Students with Disabilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Student Accessibility Services (SAS) at 155 UHS or visit https://accessibility.okstate.edu for more information. The instructor will work with you and the SDS office to provide reasonable accommodations to ensure that you have a fair opportunity to perform in this class.

Weekly Topics for ENGR 1322 – FALL 2020 SWJTU
Note: Schedule below is subject to change!

WEEK #	WEEK OF	LECTURE			AutoCAD LAB*	
		TOPICS	TEXT COVERAGE	ASSIGNMENTS	TOPICS	ASSIGNMENTS
1	14-Sep	Course Introduction; The Engineering Profession	Chapter 1	Syllabus Quiz	Basic Drawing and Modifying: 1a_First Sketch 1b_Tic Tac Toe	Lab #1
2	21-Sep	Engineering Design & The Design Cycle	Ch 2.1-2.4	Lecture Asmt #1	Isometric & Orthographic Views: 2a_CAD 2b_Home	Lab #2
3	28-Sep	No Class -- Chinese National Holiday				
4	5-Oct	Creativity & Analytical Decision Making Tools	Ch 2.5-2.6		Isometric Views and Layers: 3a_Keyway 3b_Bird House	Lab #3
5	12-Oct	Teams & Project Management	Chapter 3	Lecture Asmt #2	Arrays and Hatching: 4a_Gear 4b_Stage; 4c_Conf Table	Lab #4
		Engineering Tools I	Ch 4.1-4.3		Lab Midterm Review and Practice: 5a_Castle 5b_Clevis	Lab #5
6	19-Oct	Engineering Tools II	Ch 4.4-4.14	Lecture Asmt #3	LAB EXAM 1** [1-hour exam, Friday (Oct. 23) 8:00-9:00am]	
7	26-Oct	LECTURE MIDTERM** [1-hour exam, Friday (Oct. 30) 8:00-9:00am]			Drawing Templates, Blocks, Inserts: 6a_Part 1 6b_Part 2	Lab #6
8	2-Nov	Human Factors	Chapter 5		House Plans, Architectural Drawings, Elevations: 7a_Floor Plan; 7b_South Elevation	Lab #7
9	9-Nov	Communication in Engineering	Ch 7.1-7.7		Basic 3D Modeling & Dimensions: 8a_Keyway 8b_Bird House; 8c_H	Lab #8
10	16-Nov	Materials, Manufacturing, & 3d Printing			Advanced 3D Modeling & Flatshot: 9a_Jack in the Box 9b_Clevis; 9c_Converting to STL files	Lab #9
11	23-Nov	Engineering Failure & Analysis	Chapter 6		Lab Final Review and Practice: 10a_Bracket 10b_Handle	Lab #10
12	30-Nov	Intro to Mathcad, Matlab, and LabView. Final Exam Review		Lecture Asmt #4	LAB EXAM 2** [1-hour exam, Friday (Dec. 4) 8:00-9:00am]	
13	7-Dec	LECTURE FINAL** [1-hour exam, Friday (Dec. 11) 8:00-9:00am]				

*Note: Unless otherwise specified, all assignments are due to their Canvas dropbox *before* **Thursday at 8:00am** of the following week.
**Exams will be taken in your regular classroom, proctored by your TA.

Key due dates for Design Project:
- Design Proposal due: Thursday, October 29 before 8:00am
- Project Status Update due: Thursday, November 12 before 8:00am
- Final Report and Drawings due: Thursday, November 26 before 8:00am