The University of Texas at Tyler
Department of Mechanical Engineering

MENG 4322/5322 – CAD/CAM (Elective)

Tuesdays 3:30 PM – 6:15 PM

Syllabus (Spring 2019)

Catalog Description:

This course covers topics in object representation, geometric transformation, solid modeling, feature-based modeling, computer numerical control, kinematic modeling, and machining simulation and computer animation appropriate for the undergraduate level of work. Three hours of lecture per week.

Prerequisites:

1. MATH 3404: Multivariate Calculus
2. MENG 1201: Mechanical Engineering I or ENGR 1304: Engineering Graphics I.

Credits:

3 (3 hours lecture, 0 hours laboratory per week)

Lecture Hour Distribution (every Tuesday):

3:30 PM – 4:25 PM	Lecture/Exam Time
4:25 PM – 4:40 PM	Break Time
4:40 PM – 6:15 PM	Drawing Exercise Time

Classroom[#]:

MENG 4322/5322.001	Tyler: RBS 2019
MENG 4322/5322.040	Houston: HEC A218

[#]***You need to PHYSICALLY be in the specified classroom according to the section number you registered.***

Text(s):

Autodesk Inventor 2019, A Tutorial Introduction, *L. Scott Hansen*, SDC Publications, ISBN: 978-1-63057-169-6.

Additional Material:

Autodesk Inventor (or any other CAD software) and Lecture Slides

Course Instructor:

Dr. Shih-Feng Chou, Assistant Professor
Mechanical Engineering, The University of Texas at Tyler
3900 University Blvd., RBN 1038, Tyler TX. 75799
Office Hours: MoFr 9 – 10 AM, Tu 2:30 – 3: 30 PM, or by appointment
Phone: 903-566-6209
Email: Canvas Only (Emails to my faculty account will be deleted immediately.)

Topics Covered:

Engineering Designs; Design Drafting; Tolerance Graph Analysis; Quality Control; Geometric Tolerancing; Geometric Modeling; Basic Machine Calculations; Process Planning.

Evaluation Methods:

1. Homework[†] (40%)
2. Quizzes/Examinations[§] (40%)
3. Reports
4. Computer Programming
5. Project[¶] (20%)
6. Presentation
7. Course Participation
8. Peer Review

Course Objectives[$]:

By the end of this course students will be able to:

1. Demonstrate an understanding of technical drawing and engineering communication. [1]
2. Demonstrate an utilization of Algebraic notions to characterize geometric representation. [2]
3. Demonstrate an understanding of the basic concepts of geometric modeling and computer graphics. [1]
4. Demonstrate their ability to design and analyze practical engineering problems using geometric modeling and computer graphics. [5]
5. Demonstrate geometric transformation related to manipulations of objects' images. [2]
6. Demonstrate the area of solid and feature-based modeling. [2]
7. Demonstrate principles of parts assembly modeling and constraints. [1]
8. Demonstrate their expertise in the use of commercial CAD packages in practical engineering applications. [1,5]

[$]Numbers in brackets refer to method(s) used to evaluate the course objective.

Relationship to Program Outcomes[%]:

This course supports the following Mechanical Engineering Program Outcomes, which state that our students will be able to:

1. Apply science, mathematics and modern engineering tools and techniques to identify, formulate, and solve engineering problems. [1-3,5-7]
2. Design and effectively-communicate, with a range of audiences, mechanical components or systems. [4,8]
3. Develop and conduct experiments, collect, analyze, and interpret data, and formally communicate the results. [4,8]
4. Apply a broad-based educational experience to understand the interaction of engineering solutions with contemporary business, economic and social issues.
5. Recognize that ethical behavior and continuous acquisition of knowledge are fundamental attributes of successful mechanical engineering professionals.

[%]Numbers in brackets refer to course objective(s) that address the Program Outcome.

[†] *Homework assignments refer to weekly in-class CAD drawing exercises that must be submitted via Canvas. Submission is due 8PM the same date it was assigned.*

[§] *Midterms are in-class exams during the lecture time (see **Lecture Hour Distribution**). Exams for MENG 5322 are expected to be at the graduate level that is more difficult than the MENG 4322 section. Students with SAR status or students athletes are required to complete paperwork for accommodations in exams.*

[¶] *Final projects are team projects for MENG 4322 and individual projects for MENG 5322. Final reports are due on Canvas on Monday of the Final Exam Week. Each graduate student is required to carry out a major research report suitable for scientific publication per class project assignment.*

Classroom Policies:

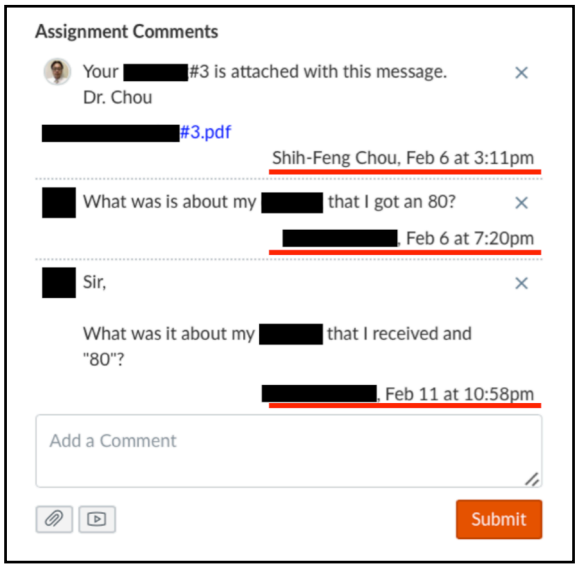
1. Classes are Tuesdays 3:30 PM – 6:15 PM with lectures/exams from 3:30 PM to 4:25 PM followed by a 15 minute break then CAD drawing sections from 4:40 PM to 6:15 PM.
2. Bring your laptop for CAD drawing exercises. Make sure your virtual desktop is working or download the stand-alone version of the CAD software for the class.
3. No food in the classroom (drinks are fine).
4. Silent your cell phones and electronic devices.
5. Please raise your hand to ask questions.
6. Person who violates or interrupts others in class will be first warned and second asked to leave.

Grading:

1. **Drawing Assignments** — UG 40%, Grad 20%
   0-100 scale, 5 pt deduction per error
2. **In-class Exam #1** (3:30 PM – 4:25 PM on 26 February, 2019) — UG 20%, Grad 20%
   0-100 scale, 5 pt deduction per error, > 5 pt for major error
3. **In-class Exam #2** (3:30 PM – 4:25 PM on 16 April, 2019) — UG 20%, Grad 20%
   0-100 scale, 5 pt deduction per error, > 5 pt for major error
4. **Final Project** (Presentation and Report) — UG 20%, Grad 40%
   0-100 scale, deductions via instructor's rubric sheets

Assignment Submission/Return Policies (must read):

1. *Assignment submission*
   1.1 This hybrid class is conducted in classrooms at both Tyler campus (face-to-face) and Houston campus (Zoom). All assignments **MUST** be submitted online via Canvas.
   1.2 Late submission is **NOT** allowed. The instructor will **NOT** respond to emails regarding late submissions.
   1.3 Email submissions of the assignments via *instructor's faculty email* will **NOT** be accepted/graded. Email will be deleted immediately/permanently due to file size.
   1.4 Only under approved circumstances by the University will the instructor extend the submission deadline for the student on Canvas. Please consult with the instructor at least **ONE WEEK** to the submission deadline.
   1.5 It is the student's responsibility to make sure that the assignment submission via Canvas is completed prior to the deadline.
   1.6 It is highly recommended that students review their submissions via Canvas to confirm the assignment submissions are fully uploaded.
   1.7 **Both improper submissions of assignments via emails and incomplete submission of assignments via Canvas will not be graded.**



2. *Assignment grading*
   2.1 Students should comply with the learning objectives and demonstrate achievements for grading.
   2.2 **Do not demand/request instructor** for grade adjustment unless the grade is miscalculated by the TA/instructor.

3. *Return of assignments*

3.1 Returns of the assignments from the instructor are done via Canvas through the Assignment Comments section (see example figure).

3.2 The instructor is **NOT** responsible to view and respond to the comments or questions from the students in the Assignment Comments section before, during, and after assignment submission (see example figure).

Course Plan:

wk.	Date	Topics	Assignments
1	1/15	Lecture#1: Syllabus Drawing#1: Getting Started on Inventor	**Drawing#1**
2	1/22	Lecture#2: Introduction to Manufacturing Drawing#2: Drawing Exercise	**Drawing#2**
3	1/29	Lecture#3: Engineering Design & Drafting Drawing#3: Learning More Basic	**Drawing#3**
4	2/5	Lecture#4: Tolerance Graph Analysis Drawing#4: Drawing Exercise	**Drawing#4**
5	2/12	Lecture#5: Quality Control Drawing#5: Detailed and Advanced Drawing	**Drawing#5**
6	2/19	Lecture#6: Geometric Tolerancing Drawing#6: Drawing Exercise	**Drawing#6**
7	2/26	**In-class Exam#1 (Lec#2 – Lec#6)** Drawing#7: Designing Part Models for Assembly	**Exam#1** **Drawing#7**
8	3/5	Lecture#7: Geometric Modeling I Drawing#8: Introduction to Assembly View Procedures	**Drawing#8**
9	3/12	**Spring Break, no class**	
10	3/19	Lecture#8: Geometric Modeling II Drawing#9: Drawing Exercise	**Drawing#9**
11	3/26	Lecture#9: Geometric Modeling III Drawing#10: Introduction to Advanced Commands	**Drawing#10**
12	4/2	Lecture#10: Basic Machine Calculations Drawing#11: Introduction to Stress Analysis	**Drawing#11**
13	4/9	Lecture#11: Process Planning Drawing#12: Introduction to Design Accelerator	**Drawing#12**
14	4/16	**In-class Exam#2 (Lec#7 – Lec#11)** Drawing#13: Introduction to Sheet Metal	**Exam#2** **Drawing#13**
15	4/23	Final Project Presentation	
16	4/30	**Final Exam Week - No Class**	**Final Report**

Dr. Chou reserves the right to change schedule in course plan.

UNIVERSITY POLICIES AND ADDITIONAL INFORMATION THAT MUST APPEAR IN EACH COURSE SYLLABUS

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.

Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:
   - copying from another student's test paper;
   - using, during a test, materials not authorized by the person giving the test;
   - failure to comply with instructions given by the person administering the test;
   - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
   - using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
   - collaborating with or seeking aid from another student during a test or other assignment without authority;
   - discussing the contents of an examination with another student who will take the examination;
   - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
   - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
   - paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
   - falsifying research data, laboratory reports, and/or other academic work offered for credit;
   - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
   - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)