

MENG 4322 – CAD/CAM
Course Syllabus

Semester / Year	Fall / 2020
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	MATH 3404: Multivariate Calculus and MENG 1301: Engineering Graphics and Design.
Section number	001, 040
Instructor name	Dr. Shih-Feng Chou
Contact info	3900 University Blvd., RBN 3005, Tyler TX. 75799 Phone: 903-566-6209 Email: schou@uttyler.edu
Class Type / Location	001: Hybrid (Face-to-face and Zoom synchronous) / RBN 2011 040: Zoom synchronous / HEC A216
Class Time	Fr 2 PM – 4:45 PM
Office Hours	Zoom meeting only: TuTh 10 – 11 AM, Mo 1 – 2 PM, or by appointment. Meeting ID: 980-7269-0601; Passcode: 613193.
Credits	3
Required Textbook	N/A
Optional References	(1) Lecture slides (2) Autodesk Inventor 2021, A Tutorial Introduction, <i>L. Scott Hansen</i> , SDC Publications, ISBN: 978-1-63057-364-5. (3) Engineering Design with SOLIDWORKS 2020, <i>David C. Planchard</i> , SDC Publications, ISBN: 978-1-63057-310-2. (4) Machining Simulation Using SOLIDWORKS CAM 2020, <i>Kuang-Hua Chang</i> , SDC Publications, ISBN: 978-1-63057-333-1.
Additional requirements	Ability to access UT Tyler virtual desktop remotely.

Evaluation Method	In-class Drafting: 20% Take-home Drafting: 20% Midterm Projects: 40% Final Project: 20%
Grading Policy / Scale	Letter grades, scale: A 90 – 100 B 80 – 89 C 70 – 79 D 60 – 69 F < 60
Important events / dates	9/4/2020 (Fr): Census date 9/25/2020 (Fr): 1 st Project 10/30/2020 (Fr): 2 nd Project 11/2/2020 (Mo): Last day to withdraw from one or more classes 12/4/2020 (Fr): Final Project
Attendance / Makeup policy	- Attendance of lectures will be regularly checked using Canvas quiz function. - No make-up project(s). - No email submission of assignment(s). All assignments MUST be submitted to Canvas for grading. - Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements. Additional policies amid COVID-19 <u>Section 001 (Tyler):</u> - Students are encouraged to physically attend lectures in RBN 2011 in alternating weeks assigned by the instructor. - Maximum seating capacity is 10 students in RBN 2011. - Synchronous zoom is provided for class learning. <u>Section 040 (HEC):</u> - Students will be entering live Zoom individually for synchronous class learning. - Until further noticed by the instructor, students will NOT be attending lectures in HEC A216.
Course Learning Outcomes / ABET & PEOs relation	By the end of this course, students should be able to: - Demonstrate an understanding of technical drawing and engineering communication. - Demonstrate an utilization of Algebraic notions to characterize geometric representation. - Demonstrate an understanding of the basic concepts of geometric modeling and computer graphics. - Demonstrate their ability to design and analyze practical engineering problems using geometric modeling and computer graphics.

	5. Demonstrate geometric transformation related to manipulations of objects’ images. 6. Demonstrate the area of solid and feature-based modeling. 7. Demonstrate principles of parts assembly modeling and constraints. 8. Demonstrate their expertise in the use of commercial CAD packages in practical engineering applications.																																																																				
Tentative Topics	Engineering Designs and Drafting; Tolerance Graph Analysis; Geometric Modeling; Geometric Tolerancing; Part Assembly; Basic Machine Calculations; Process Planning and Quality Control.																																																																				
Other	Tentative Schedule: <table><tr><th>Week</th><th>Date</th><th>Topics</th><th>Assignments</th></tr><tr><td>1</td><td>8/28</td><td>Lec#1: Syllabus and Drawing Policies Drawing#1: Getting Started on CAD</td><td>Pre-requisite HW#1</td></tr><tr><td>2</td><td>9/4</td><td>Lec#2: Introduction to CAD Drawing#2: Learning More Basics</td><td>HW#2</td></tr><tr><td>3</td><td>9/11</td><td>Lec#3: Engineering Design and Drafting Drawing#3: Detailed and Advanced Drawing</td><td>HW#3</td></tr><tr><td>4</td><td>9/18</td><td>Lec#4: Dimension and Tolerance Drawing#4: Drawing Exercise</td><td>HW#4</td></tr><tr><td>5</td><td>9/25</td><td>Project#1: CAD Modeling</td><td></td></tr><tr><td>6</td><td>10/2</td><td>Lec#5: Geometric Modeling I Drawing#5: Designing Parts for Assembly</td><td></td></tr><tr><td>7</td><td>10/9</td><td>Lec#6: Geometric Modeling II Drawing#6: Part Assembly</td><td>HW#5</td></tr><tr><td>8</td><td>10/16</td><td>Lec#7: Geometric Modeling III Drawing#7: Designing Parts for Assembly</td><td></td></tr><tr><td>9</td><td>10/23</td><td>Lec#8: Geometric Tolerancing Drawing#8: Part Assembly</td><td>HW#6</td></tr><tr><td>10</td><td>10/30</td><td>Project#2: CAD Modeling</td><td></td></tr><tr><td>11</td><td>11/6</td><td>Lec#9: Introduction to CAM Drawing#9: Drilling, Milling, and Turning</td><td></td></tr><tr><td>12</td><td>11/13</td><td>Lec#10: Basic Machine Calculations Drawing#10: A Quick Run Through</td><td>HW#7</td></tr><tr><td>13</td><td>11/20</td><td>Lec#11: Process Planning and Quality Control Drawing#11: Machining a Robotic Forearm Member</td><td>HW#8</td></tr><tr><td>14</td><td>11/27</td><td colspan="2">Thanksgiving Break – No Class</td></tr><tr><td>15</td><td>12/4</td><td>Project#3: CAM</td><td></td></tr><tr><td>16</td><td>12/11</td><td colspan="2">Final Exam Week – No Class</td></tr></table> (Dr. Chou reserves the right to change schedule in course plan.)	Week	Date	Topics	Assignments	1	8/28	Lec#1: Syllabus and Drawing Policies Drawing#1: Getting Started on CAD	Pre-requisite HW#1	2	9/4	Lec#2: Introduction to CAD Drawing#2: Learning More Basics	HW#2	3	9/11	Lec#3: Engineering Design and Drafting Drawing#3: Detailed and Advanced Drawing	HW#3	4	9/18	Lec#4: Dimension and Tolerance Drawing#4: Drawing Exercise	HW#4	5	9/25	Project#1: CAD Modeling		6	10/2	Lec#5: Geometric Modeling I Drawing#5: Designing Parts for Assembly		7	10/9	Lec#6: Geometric Modeling II Drawing#6: Part Assembly	HW#5	8	10/16	Lec#7: Geometric Modeling III Drawing#7: Designing Parts for Assembly		9	10/23	Lec#8: Geometric Tolerancing Drawing#8: Part Assembly	HW#6	10	10/30	Project#2: CAD Modeling		11	11/6	Lec#9: Introduction to CAM Drawing#9: Drilling, Milling, and Turning		12	11/13	Lec#10: Basic Machine Calculations Drawing#10: A Quick Run Through	HW#7	13	11/20	Lec#11: Process Planning and Quality Control Drawing#11: Machining a Robotic Forearm Member	HW#8	14	11/27	Thanksgiving Break – No Class		15	12/4	Project#3: CAM		16	12/11	Final Exam Week – No Class	
Week	Date	Topics	Assignments																																																																		
1	8/28	Lec#1: Syllabus and Drawing Policies Drawing#1: Getting Started on CAD	Pre-requisite HW#1																																																																		
2	9/4	Lec#2: Introduction to CAD Drawing#2: Learning More Basics	HW#2																																																																		
3	9/11	Lec#3: Engineering Design and Drafting Drawing#3: Detailed and Advanced Drawing	HW#3																																																																		
4	9/18	Lec#4: Dimension and Tolerance Drawing#4: Drawing Exercise	HW#4																																																																		
5	9/25	Project#1: CAD Modeling																																																																			
6	10/2	Lec#5: Geometric Modeling I Drawing#5: Designing Parts for Assembly																																																																			
7	10/9	Lec#6: Geometric Modeling II Drawing#6: Part Assembly	HW#5																																																																		
8	10/16	Lec#7: Geometric Modeling III Drawing#7: Designing Parts for Assembly																																																																			
9	10/23	Lec#8: Geometric Tolerancing Drawing#8: Part Assembly	HW#6																																																																		
10	10/30	Project#2: CAD Modeling																																																																			
11	11/6	Lec#9: Introduction to CAM Drawing#9: Drilling, Milling, and Turning																																																																			
12	11/13	Lec#10: Basic Machine Calculations Drawing#10: A Quick Run Through	HW#7																																																																		
13	11/20	Lec#11: Process Planning and Quality Control Drawing#11: Machining a Robotic Forearm Member	HW#8																																																																		
14	11/27	Thanksgiving Break – No Class																																																																			
15	12/4	Project#3: CAM																																																																			
16	12/11	Final Exam Week – No Class																																																																			

Important Covid-19 Information for Classrooms and Laboratories

Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times in public settings (including classrooms and laboratories), as specified by [Procedures for Fall 2020 Return to Normal Operations](#). The UT Tyler community of Patriots views adoption of these practices consistent with its [Honor Code](#) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home and may join the class remotely. Students who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class remotely. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

University Policies:

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)