UTTyler ENGINEERING

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MENG 3303 – Dynamics of Machinery
Course Syllabus

Semester / Year	Spring 2026
Catalog Description	Analysis of the kinematics and forces in mechanical mechanisms and assemblies. Three hours of lecture per week.
Prerequisites	C or Better in all the following: ENGR 2302 - Dynamics
Section Number	050
Instructor Name	Dr. Chung Hyun Goh
Contact Information	Email: cgoh@uttyler.edu Phone: 903-566-6125 Office: RBN 3007
Class Type / Instruction Mode / Location	Face-to-face / Lecture / RBN 3039
Class Time	Tu/Th 2:00 PM – 3:20 PM
Office Hours	W 10:30 AM – 11:30 AM, Tu/Th 10:00 AM – 11:00 AM or by appointment
No. of Credits	3 credits (Lecture)
Required Textbook	Design of Machinery-An Introduction to the Synthesis and Analysis of Mechanisms and Machines, 6th Ed. – R.L. Norton (Lecture)
Optional References	Motion Simulation and Mechanism Design with SolidWorks Motion 2019, SDC – K.H. Chang (SW Tutorial Sessions) Introduction to Mechanism Design: With Computer Applications, E. Constans and K.B. Dyer, CRC Press
Additional Rules and Requirements	Since the mechanical engineering program is designed to prepare students for professional practice, all submitted work (e.g., homework, lab reports, projects, presentations) is expected to meet professional standards. Work that does not reflect professional quality may be subject to grade reductions, even if professionalism is not explicitly listed in the grading rubric. A software package will be selected for use as a learning support tool, and the course includes a project as a major component. AI tools are allowed to support students' learning and productivity, provided that their use aligns with academic integrity standards. When required, students must disclose their use of AI.
Evaluation Method	Design Workshop 20%, Tutorial Flipped Classes 10% Mid-term Exam 20% Final Exam 20% Assignment: 30% (Homework 10%, Quizzes 10%, Course Participation 10%)
Grading Policy / Scale	Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60
Important Events / Dates	Census date: 01/26/2026 First drop for non-payment: 02/04/2026 Exam date: Mid-term (February 24, 2026), Final Exam (April 28, 2026) Last date to withdraw from one or more 15-week courses: 03/30/2026

<table>
<tr><td>Attendance / Makeup policy / other rules</td><td>Regular attendance is imperative if you want to do well in this course. Therefore, regular attendance is highly recommended. In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class on HomeWorks, tests etc. No makeup exams will be authorized without providing an official document showing that your absence is in line with university rules.</td></tr>
<tr><td>Course Learning Objectives / ABET & PEOs Relation</td><td>By the end of this course, students will be able to:
1. Recognize different mechanisms and determine the degree of freedom.
2. Analyze a linkage for paths, velocity, and acceleration.
3. Understand the basics of cam mechanisms and apply to a cam-follower design.
4. Apply practical approach to optimum involute spur gears and gear trains design.
5. Apply acquired knowledge and skills during the course and previous courses to solve a design problem requiring resourcefulness.</td></tr>
<tr><td>Tentative Topics / Course Plans</td><td>Semester course outline and plan (tentative)
Detailed Schedule (Appendix A): A detailed, meeting-by-meeting schedule (dates, topics, readings, quizzes, and exam review sessions) is included in this syllabus as Appendix A: Course Outline (starting at p. 3). The schedule is tentative and subject to change.
The summary below highlights major modules and key assessments. The schedule is subject to change; updates will be announced in class and on Canvas.
<table>
<tr><th>Week</th><th>Topics (summary)</th><th>Key items</th></tr>
<tr><td>Weeks 1-2</td><td>Intro; Ch 2 kinematics fundamentals; Ch 3 graphical linkage synthesis; design workshop guidelines and team ideation</td><td>Quiz #0; team formation</td></tr>
<tr><td>Weeks 3-4</td><td>Ch 4 position analysis (two lectures)</td><td>Quiz #1</td></tr>
<tr><td>Weeks 5-6</td><td>Ch 6 velocity analysis; Ch 7 acceleration analysis</td><td>Quiz #2</td></tr>
<tr><td>Week 7</td><td>SolidWorks and MATLAB/Simulink/Simscape intro; midterm review; midterm exam; SolidWorks Motion session</td><td>Midterm Exam</td></tr>
<tr><td>Weeks 8-9</td><td>Ch 8 cam design; Spring Break (Mar. 9-13, 2026, no class); Ch 9 gear train design</td><td>Quiz #3 and Quiz #4</td></tr>
<tr><td>Weeks 10-11</td><td>Computer-aided motion analysis flipped classes (Tutorial sessions)</td><td>Tutorial flipped class activities</td></tr>
<tr><td>Weeks 12-13</td><td>Ch 10 dynamic fundamentals; MATLAB/Simulink analyses; Ch 12 balancing</td><td>Quiz #5</td></tr>
<tr><td>Week 14 and Finals</td><td>Final review; design workshop presentations and demo; final exam</td><td>Design Workshop; Final Exam</td></tr>
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<tr><td>University Policies</td><td>https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information-rev122025.pdf</td></tr>
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Note:
The instructor reserves the right to modify the syllabus at any time during the semester to accommodate unforeseen circumstances, enhance the learning experience, or ensure the course objectives are met. Any changes will be communicated promptly to all students.

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Appendix A: Course Outline

MENG 3303-001: Dynamics of Machinery
Spring Semester, 2026 / Tu/Th 2:00 PM - 3:20 PM / RBN 3039

Mtg	Day	Date	Topic	Reading*	Remarks
1	Tu	1/13	Introduction & Ch 2 Kinematics Fundamentals 1	Ch 2.1-2.6	Quiz #0
2	Th	1/15	Chap 2 - Kinematics Fundamentals 2	Ch 2.10-2.13	
3	Tu	1/20	Chap 3 - Graphical Linkage Synthesis	Ch 3.1-3.5	
4	Th	1/22	**Design Workshop Guidelines / Team Ideation for Design Workshop**		
5	Tu	1/27	Chap 4 - Position Analysis 1	Ch 4.1-4.5	
6	Th	1/29	Chap 4 - Position Analysis 2	Ch 4.6-4.12	Quiz #1
7	Tu	2/3	Chap 6 - Velocity Analysis 1	Ch 6.1-6.4	
8	Th	2/5	Chap 6 - Velocity Analysis 2	Ch 6.5-6.7	
9	Tu	2/10	Chap 7 - Acceleration Analysis 1	Ch. 7.1-7.3	
10	Th	2/12	Chap 7 - Acceleration Analysis 2	Ch. 7.3-7.7	Quiz #2
11	Tu	2/17	**Introduction to SolidWorks and MATLAB/Simulink/Simscape**		
12	Th	2/19	**Review Session for Mid-term Exam (Chapters 1 - 7)**		
13	Tu	2/24	**Mid-term Exam - Chaps 1 - 7**		
14	Th	2/26	**Mechanism Motion Analysis using SolidWorks Motion**		
15	Tu	3/3	Chap 8 - Cam Design 1	Ch. 8.1-8.4	
16	Th	3/5	Chap 8 - Cam Design 2	Ch 8.4-8.6	Quiz #3
	Tu	3/10	**Spring Break (No Class)**		
	Th	3/12	**Spring Break (No Class)**		
17	Tu	3/17	Chap 9 - Gear Train Design 1	Ch. 9.1-9.6	
18	Th	3/19	Chap 9 - Gear Train Design 2	Ch. 9.7-9.12	Quiz #4
19	Tu	3/24	**Computer-Aided Motion Analysis #1 (Flipped Class)****		
20	Th	3/26	**Computer-Aided Motion Analysis #2 (Flipped Class)****		
21	Tu	3/31	**Computer-Aided Motion Analysis #3 (Flipped Class)****		
22	Th	4/2	Chap 10 - Dynamic Fundamentals 1	Ch. 10.1-10.8	
23	Tu	4/7	Chap 10 - Dynamic Fundamentals 2	Ch. 10.9-10.15	
24	Th	4/9	**Position/Velocity/Acceleration Analyses using MATLAB and Simulink**		
25	Tu	4/14	Chap 12 - Balancing	Ch 12.1-12.6	Quiz #5
26	Th	4/16	**Review Session for Final Exam (Chapters 8 - 10)**		
27	Tu	4/21	**Design Workshop (Technical Presentations and Functionality Demonstration)*****		
28	Th	4/23	**No Class (Assignment)**		
	Tu	4/28	**Final Exam (2 pm to 4 pm) - Chaps 8 - 12**		

* Reading assignment to be completed BEFORE coming to class on the day it is assigned
**Flipped classes will be given using tutorial teaching materials and guidelines.
***This is a team-based performance. The guidelines will be provided by the instructor.