



MENG 3303 – Dynamics of Machinery

Course Syllabus

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| Semester / Year | Spring 2025 |
| Catalog Description | Analysis of the kinematics and forces in mechanical mechanisms and assemblies. Three hours of lecture per week. |
| Prerequisites | Grade C or better in ENGR 2302 - Dynamics |
| Section Number | 030 |
| Instructor Name | Ola Al-Shalash |
| Contact Information | Office: Houston Engineering Center: HEC A212 E-mail: osalshalash@uttyler.edu |
| Class Type / Location | Face-to-face Location: HEC B210 |
| Class Time | Tuesday and Thursday 9:30 am – 10:50 am |
| Office Hours | Tuesdays and Thursdays 11:00 am – 12:30 pm or by appointment |
| No. of Credits | 3 credits |
| Required Textbook | Design of Machinery -An Introduction to the Synthesis and Analysis of Mechanisms and Machines, 6th Ed. – R.L. Norton |
| Optional References | Motion Simulation and Mechanism Design with SolidWorks (SW Tutorial Sessions) |
| Additional Rules and Requirements | - Handouts and manuals posted on Canvas. - AI is permitted only for specific assignments or situations, and appropriate acknowledgment is required. |
| Evaluation Method | Grading: Midterm Exam 25 % Final Exam 30 % Homework 15 % Design Workshop 20 % Class Discussion 5 % Course Participation & Attendance 5 % |
| Grading Policy / Scale | Letter grades, <i>scale</i> : A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60 Grade appeal Grades can be appealed by sending an email then meeting the instructor during office hours, but no later than three days after the grade has been posted. Moreover, students may appeal any grade reduction to the instructor if valid excuse with documentation is provided. |
| Important Events / Dates | Census date: January 27 Last day to withdraw: March 31 Midterm Exam: Week of Mar. 3 Final Exam: Thursday, May 1 st @ 9:30 am |



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| <p>Attendance / Makeup policy/ other rules</p> | <ul style="list-style-type: none">• Attendance is expected per university policy. Regular attendance is highly recommended. It is imperative if you want to do well in this course.• Attendance will be taken and regularly checked using Canvas. Students who come to class after attendance is taken will be considered absent.• 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.• Students will not be permitted to leave the classroom during lectures except for extreme emergencies.• No email submission of assignments, HomeWorks, etc. All assignments MUST be submitted to Canvas for grading.• No makeups unless students provide a university accepted excused absence with proper documentation justifying the absence.• Questions involving knowledge covered in class will be answered if the student proves that they have tried to come up with the answer. Solution to homework will not be given. However, students can work on the right solution by checking their work with the instructor.• Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements.• Any minor violation of the Student Behavior (see below) by a student as deemed by the instructor will result in a full letter grade reduction for each incident while any major violation(s), such as cheating and plagiarism, by a student as deemed by the instructor will result in automatic failing grade in the course.• The use of cellular phones during lectures is prohibited. If a student uses the cellular phone (call, text, internet), he/she will be asked to leave the classroom and penalties of missing the class will apply. It is highly recommended to keep your cellular phone off.• No food is allowed in the classroom.• Late submissions of assignments/ Homework (e.g. if due at 11:59:00 pm, then any time after such as 11:59:30 pm is late) will result in 20 % deduction per day from the graded score.• Given this is a professional, educational setting you are expected to dress and behave appropriately. A positive, mature attitude/behavior is expected from the students in all classes. Students disturbing directly or indirectly the class or other students will be asked to leave the classroom with the consequences associated to an absence.• Students are encouraged to utilize any tutoring services available if needed and come prepared to each week's class. Each student is expected to work with the group in a professional manner in case of any group activities. It is important to communicate clearly and professionally of any concerns or issues to the instructor.• Canvas should be the primary mode of contacting the instructor so check the Canvas announcements and discussion board to check for information about the course. In addition, university provided patriots email should be the official communication method and you should check your email regularly. Use the above email address or Canvas messaging if you want to email the instructor. Please use MENG 3303- your section, your question or concern title in the email subject line. Please allow the instructor at least one to two business days to respond to your email. Emails with |
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| | <p>improper language will not be answered. Emails with same concerns or questions from multiple students will be answered/covered during class time.</p> <ul style="list-style-type: none">• The syllabus is subject to change during the semester as deemed necessary. Students will be notified for any major changes. |
| Course Learning Outcomes / ABET & PEOs relation | <p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none">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. |
| Tentative Topics | <ul style="list-style-type: none">• Fundamentals of kinematics and dynamics of linkages and mechanisms• Kinematic analysis and synthesis of linkages: position, velocity, and acceleration analyses• Cam design• Gear design and gear trains |
| University Policies | <p>https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf</p> |



Tentative Course Schedule

| # | Week of | Lecture Activity |
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| 1 | Jan. 13 | Syllabus + introduction + Chapter 1 Chapter 2: Kinematics Fundamentals |
| 2 | Jan. 20 | Chapter 2: Kinematics Fundamentals Chapter 3: Graphical Linkage Synthesis |
| 3 | Jan. 27 | Chapter 3: Graphical Linkage Synthesis |
| 4 | Feb. 3 | Chapter 4: Position Analysis |
| 5 | Feb. 10 | Chapter 6: Velocity Analysis |
| 6 | Feb. 17 | Chapter 7: Acceleration Analysis |
| 7 | Feb. 24 | Chapter 7: Acceleration Analysis |
| 8 | Mar. 3 | Midterm Exam |
| 9 | Mar. 10 | Design Workshop/ Mechanism Design with SolidWorks |
| 10 | Mar. 17 | Spring break – No Classes |
| 11 | Mar. 24 | Chapter 8: Cam Design |
| 12 | Mar. 31 | Design Workshop/ Mechanism Design with SolidWorks |
| 13 | Apr. 7 | Chapter 9: Gear Train Design |
| 14 | Apr. 14 | Design Workshop/ Mechanism Design with SolidWorks |
| 15 | Apr. 21 | Chapter 10: Dynamic Fundamentals |
| 16 | Apr. 28 | Final Exam on May 1 |