

MENG 4317 – Vibrations
Course Syllabus

Semester / Year	Fall 2025
Catalog Description	Analysis and prediction of the free and forced dynamic behavior and of mechanical systems; first, second, and higher order systems; vibration isolation and absorption; vibration characteristics of rotating machinery.
Prerequisites	ENGR2302 (Dynamics), MATH 3305 (Differential Equations) with a minimum “C” grade.
Section Number	001, 051
Instructor Name	Dr. A. Ibrahim
Contact Information	Email: aibrahim@uttyler.edu Office: RBN 3008
Class Type / Instruction Mode / Location	Hybrid mode Tyler Room: RBN 03041 HEC Room: HEC 0A218
Class Time	Tu/Th 3:30 PM - 4:50 PM
Office Hours	Tu 9:30 AM - 12:30 PM or by appointment
No. of Credits	3
Required Textbook	No textbook is required as lectures will reference material from various texts and provide a full complement of lecture notes.
Optional References	<ul style="list-style-type: none"> - Engineering Vibration, 5th edition, Pearson - Daniel J. Inman, ISBN-13: 9780136809531 - Mechanical Vibrations, 6th edition, Pearson, Singiresu S. Rao, ISBN-13: 9780137515288
Additional Rules and Requirements	<ol style="list-style-type: none"> 1. This course requires knowledge of programming, specifically MATLAB. The instructor will not provide instruction on programming skills; however, MATLAB codes and examples will be shared to assist with assignments and projects. Students are expected to have a foundational understanding of programming concepts to utilize these resources and complete course tasks effectively. 2. 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	First Exam 30% Second Exam 30% Final Exam: 40%
Grading Policy / Scale	Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60 Note: 89.4 == B
Important Events /	Census date: September 8 th , 2025. Last date to withdraw from one or more 15-week courses: November 3, 2025



Dates	<p>https://www.uttyler.edu/academics/academic-calendar-25-26/academic-calendar-15-week-and-summer.php</p> <p>First Exam: Thursday, October 9th, 2025 Second Exam: Thursday, November 13th, 2025 Final Exam: As Assigned by UT Tyler for the Final Exam (TBD) Thanksgiving holidays for faculty and students: November 24-28</p>
Attendance / Makeup policy / other rules	<ol style="list-style-type: none">1. Mandatory Attendance: Regular attendance is required for this course. Students are expected to attend every class session on time and stay for the entire duration. Attendance will be taken at the beginning of each class.2. Absences: Students are allowed a maximum of 3 unexcused absences during the semester. Any additional unexcused absence will result in failing the course and an F as a final grade.3. Excused Absences: Excused absences include illness (with a doctor's note), family emergencies, university-sponsored events, or other circumstances approved by the instructor in advance. Documentation must be provided within one week of the missed class.4. Tardiness: Arriving late to class is disruptive and will be recorded. Three instances of tardiness will count as one unexcused absence. If you arrive more than 10 minutes late, it will be considered an absence.5. Participation: Active participation is strongly encouraged to enhance your learning experience and requires regular attendance. Attending classes consistently and engaging in discussions will greatly benefit your understanding of the course material.6. Pop Quizzes: The instructor reserves the right to administer unannounced quizzes anytime throughout the semester. These quizzes may cover recent material, reinforce key concepts, or assess attendance.7. Senior Design Project: Engagement in Senior Design Projects, including related meetings or presentations, will not be accepted as an excuse for missing class. Any absence due to these commitments will count as a missed class.8. Make-Up Work: Students who miss a class with a valid, documented excuse may be allowed to make up missed work at the instructor's discretion. It is the student's responsibility to contact the instructor to arrange for any make-up work.9. Notification of Absence: If you anticipate missing a class, please notify the instructor as soon as possible. Failure to inform the instructor in advance may result in the absence being marked unexcused.10. Withdrawal: If your absences become excessive and are impacting your performance, the instructor may recommend withdrawing from the course. Be mindful of the university's deadlines for course withdrawal.
Course Learning Objectives / ABET & PEOs Relation	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none">1. Formulate analyzable models of vibrating mechanical systems.2. Solve single-degree-of-freedom (SDOF) free and forced vibration problems using analytical and computer methods.3. Solve multiple-degree-of-freedom (MDOF) vibration problems using analytical and computer methods.4. Vibration of continuous systems.



Tentative Topics / Course Plans	<ol style="list-style-type: none">1. <i>Vibration and Free Response.</i>2. <i>Response to Harmonic Excitation.</i>3. <i>General Force Response</i>4. <i>Vibration of MDOFS</i>5. <i>Vibration of continuous systems.</i>
University Policies	https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf

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.