Department of Mechanical Engineering
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Uttyler.edu/engineering

MENG 4317 – Vibrations
Course Syllabus

Semester / Year	*Fall 2024*
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	*050, 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 02012* *HEC Room: HEC 0A217*
Class Time	*Tu/Th 3:30 PM - 4:50 PM*
Office Hours	*Tu/Th 11:00 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	- *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	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	***Assignments & Quizzes 20%*** ***First Exam 25%*** ***Second Exam 25%*** ***Final Project: 30%*** ***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.***

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 / Dates	*Census date: September 9th, 2024.* *Last date to withdraw from one or more 15-week courses: November 4, 2024* *https://www.uttyler.edu/schedule/files/2024-2025/academic-calendar-2024-2025-main-20240724.pdf* *Assignments: Expect assignments every week.* ***First Exam: Thursday, October 17th*** ***Second Exam: Thursday, December 5th*** ***Final Project: As assigned by UT Tyler for the Final Exam (TBD)***
Attendance / Makeup policy / other rules	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 part of your grade and requires regular attendance. Missing classes without a valid reason may affect your participation score.* 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 &	*By the end of this course, students will be able to:* *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.*

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PEOs Relation	*3. Solve multiple-degree-of-freedom (MDOF) vibration problems using analytical and computer methods.* *4. Vibration of continuous systems.*
Tentative Topics / Course Plans	*1. Vibration and Free Response.* *2. Response to Harmonic Excitation.* *3. General Force Response* *4. Vibration of MDOFS* *5. Vibration of continuous systems.*
University Policies	*https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf*