

MENG331 – Dynamics of Machinery			
Eastern Mediterranean University Faculty of Engineering			
Department: Mechanical Engineering			
Program Name: Mechanical Engineering		Program Code: 23	
Course Code: MENG331	Course Title: Dynamics of Machinery	Credits: 4 Cr	Year/Semester: 2019-2020 Fall
<input checked="" type="checkbox"/> Engineering or Area Core <input type="checkbox"/> Engineering Course offered by other programs <input type="checkbox"/> Engineering or Area Elective <input type="checkbox"/> Mathematics and Basic Sciences <input type="checkbox"/> General Education			
Prerequisite(s): MENG233 or MENG231 and MATH207 or MATH241			
Catalog Description: Mechanical vibrations: 2-DOF vibrating systems, vibration measuring instruments, numerical methods for multi-degree of freedom systems, Dunkerley's equations, vibration of continuous systems, random vibrations. Balancing of machinery: rigid rotors, reciprocating machines, flywheels, planar linkages, balancing machines and instrumentation. Cam dynamics, gyroscope and governors.			
Instructor Name: Associate Professor Dr Qasim Zeeshan		Office no: ME141	Office Tel: 6301361
Course Web Page: https://staff.emu.edu.tr/qasimzeeshan/en			
Textbook(s): Mechanical Vibrations by Rao Singiresu (5th Edition) - Pearson Publications. Mechanical Vibrations by William Palm (1st Edition) - Wiley Publications. Design of Machinery by Robert L. Norton (5th Edition) - McGraw Hill. Kinematics and Dynamics of Machinery by Robert L. Norton SI Edition- McGraw Hill.			
Indicative Basic Reading List :			
Topics Covered and Class Schedule: (4 hours of lectures and 1 hour of tutorial and lab per week) Week 1 Fundamentals of Vibration Week 2 Free Vibration of Single Degree of Freedom Systems Week 3 Harmonically Excited Vibration Week 4 Harmonically Excited Vibration Week 5 Two-Degree of freedom systems Week 6 Two-Degree of freedom systems Week 7 Revision Weeks 8-10 Mid-Term Examination Week 11 Vibration Measurement and Applications Week 12-13 Modal Analysis Week 14 Vibration Control Week 14-15 Revision Week 15 Final Examination			

Lecture and Tutorial Learning Outcome		Student Outcomes	Performed Assessments and Percentage
<ul style="list-style-type: none"> Understand the fundamentals of vibration. Understand equivalent spring & Mass system. Understand the free response of one-degrees of freedom system. Understand the response of one-degree freedom systems with damping. Understand the response of two-degree freedom systems. Understand the mode shapes of two-degree freedom systems. Understand the fundamental of vibration measurement in the real world. 		1	Quiz 1: 5% Midterm Exam: 30% Quiz 2: 5% Project: 10% Final Examination: 40%
Lab. Experiment Title and Lab. Equipment Used	Lab Learning Outcome	Student Outcomes	Performed Assessments and Percentage
Lab #1- Determination of the stiffness of two different springs	2 .Understand equivalent spring & Mass system.	6	Lab Works and Lab Attendance % 10
Lab #2- Determination of moment of inertia	1. Understand the fundamentals of vibration.		
Lab #3- Damped free vibrations	3 .Understand the free response of one-degrees of freedom system. 4 .Understand the response of one-degree freedom systems with damping.		
Lab #4- Mode shape analysis of cantilever beam with ANSYS	7.Understand the fundamental of vibration measurement in the real world.		
Lab #5: Static and Dynamic Balancing of shafts			

Student Outcomes

<input checked="" type="checkbox"/>	1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
<input type="checkbox"/>	2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
<input type="checkbox"/>	3. an ability to communicate effectively with a range of audiences
<input type="checkbox"/>	4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
<input type="checkbox"/>	5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
<input checked="" type="checkbox"/>	6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
<input type="checkbox"/>	7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Contribution of Course to Criterion 5

Credit Hours for:

Mathematics & Basic Science : 0

Engineering Sciences and Design : 4

General Education : 0

Important Notes:

University rules and regulations are applied to this course. **For details, please see** <http://mevzuat.emu.edu.tr>

1. **“NG” Nil Grade/ Failing from Absenteeism:** Students who do not comply with the required level attendance and/or not fulfilling the requirements for the evaluation of the course are given the “NG” grade by the Instructor of the Course based on the criteria determined by the Faculty/School Academic Council. Students are informed about the criteria for receiving the “NG” grade by the related course instructor at the beginning of the semester. “NG” grade is included in the computation of GPA and CGPA.
2. Student attendance is monitored and assessed by the course instructor. A student who fails to meet the requirements of a course or who is absent more than the limit specified by the Faculty or School is considered to be unsuccessful in that course.
3. Students who do not attend any of the above assessment activities (such as mid-term exam, lab exam, homework, design project report etc.) will be given NG (Nil Grade).
4. Late Submissions of the Assignments, Lab Reports and Project will be graded as zero.

MAKE-UP EXAM:

1. There is no make-up or resit for the Quiz and Labs.
2. A student who fails to sit for an examination for a valid reason is given a make-up exam. Within three working days after the examination, students who wish to take a make-up must submit a **written statement** to the course instructor explaining the reason(s) for his/her request.
3. Eligibility to take a **Make-Up Exam**:
 - a. Student must contact the Instructor immediately within “**three working days**” after the examination when (s)he has missed the mid-term exam or final exam and to discuss with the faculty about the date and time to take the make-up exam.
 - b. Student must secure a “**Make-Up Exam Form**” from the department Office or from instructor website & fill-out the Form. For each Make-Up Exam, please use separate Form.
 - c. Student must secure the approval from the instructor for taking the Make-Up Exam.
 - d. Failure to take the Make-Up Exam at the agreed date and time will lead to a “NG” Grade for the Make-Up Exam, midterm or final.