MENG376 – Machine Elements II
Eastern Mediterranean University **Faculty of Engineering**

Department:
Mechanical Engineering

Program: Mechanical Engineering	Program Code: 23	Year/Semester: 2019-2020 FALL			
Course Code: MENG 376	**Course Title:** Machine Elements II	**Credit hours**			
		Lec.	**Tut**	**Lab/Activity**	**Total**
		3	**1**	**0**	**3**

Criterion 5
Subject Area:

☐ (a) College-level mathematics and basic sciences with experimental experience appropriate to the program.
☒ (b) Engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
☐ (c) a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.
☐ (d) a culminating major engineering design experience that
   ☐ 1) Incorporates appropriate engineering standards and multiple constraints
   ☐ 2) Based on the knowledge and skills acquired in earlier course work.

Hourly Contribution
☐ Basic Science ()
☐ College-level Mathematics ()
☐ Complex Engineering Problems ()
☒ Engineering Design (3)
☐ Engineering Science ()
☐ Team ()

Type of Course
☒ Engineering or Area Core
☐ Engineering Course offered by other programs
☐ Engineering or Area Elective
☐ Mathematics and Basic Sciences
☐ General Education

Prerequisite(s): MENG375 Machine Elements I

Catalog Description:
Shaft materials, shaft layout and shaft design for stress. Screws and Fasteners, standards of bolts and screws, mechanics of power screws, stresses in threads, joints stiffness, tension joints, fatigue loading of tension joints, bolted and riveted joints. Stresses and deflection in helical springs, compression springs and spring materials, spring design for fatigue loading, extension springs and torsion springs. Rolling contact bearings, selection and design of rolling bearings, Lubrication and journal bearings with types of lubrication, failure calculations and bearing selection. Gear types and force analysis in gears. Spur and Helical gears, stress and factor of safety calculations, gear design. Bevel and Worm Gears, Bevel-Gear stresses, Worm-Gear analysis, designing a Worm-Gear mesh.

Course Web Page:
Textbook(s): Shigley's Mechanical Engineering, R. G. Budynas and J. K. Nisbett, 9th edition.
Topics Covered and Class Schedule:

Week 1-3	Shaft Materials, Shaft Layout, Shaft Loads, Stresses and Failure, Shaft Design
Week 4-5	Screws and Fasteners, Mechanics of Power screws, stresses in threads, Fatigue Loading of Tension joints, Bolted and Riveted Joints.
Week 6-7	Gears in General, Types of Gears, Force Analysis in Gears
Week 8-9	**Mid-Term Examination Week**
Week 10-11	Rolling Contact Bearings, Selection and Design of Rolling Bearings Lubrication and Journal Bearings, Viscosity and Bearing Selection.
Week 12	Spring Materials, Stresses in Helical Springs, Compression, Extension and Torsion Springs.
Week 13	Spur and Helical Gears, Stress Analysis in Gears, Gear Design
Week 14	Bevel and Worm Gears, Stresses and Strengths in Bevel Gears, Worm Gear Analysis, Designing a Worm Gear Mesh.
Week 15	**Final Examination Week Starts**

Lecture and Tutorial Outcomes	Student Outcomes	Performed Assessments and Percentage
- Understand the Shaft Loads, stresses and Failure mechanism. - Understand the Key and Keyways, their stresses - Learn the effect of lubricants and viscosity - Learn the materials in bearings. Distinguishing the types of bearings - Understanding the Spur gear geometry, gear tooth theory, fundamental law of gearing. Loading and Stresses in spur gears. - Understanding the Helical, bevel and worm gear geometries, loading and stresses. - Learn the Spring Configurations, spring materials, Dynamic Loading and Stresses. - Understanding the thread forms, screw and fastener manufacturing processes, material selection, and stress distributions.	**(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.** **(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public safety.**	Midterm 25% Final 40%

	(3) 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.	Design Project 15%
•		Quiz 1 and Quiz 2 15%
• Measuring their knowledge about topics covered		
• Motivating them to come to class and keep them ready for the exam		Attendance and Homework 5%

Important Notes:
- University rules and regulations are applied to this course.
- Attendance is essential, minimum of 80% of attendance is required for regular students. Any attendance less than 50% will be treated as NG.
- No make-up exam is held for quizzes.