

**MECHANICAL ENGINEERING PROGRAM**  
**ABET COURSE SYLLABUS**

**ME 329 Mechanical Systems Design (4 Units) Required**

<b>Course Descriptions:</b> <b>(2019-20 Catalog)</b>	Design of mechanical equipment and systems using various machine elements and components such as threaded fasteners, power screws, springs, gears, bearings, clutches, prime movers, etc. Decision modeling based on technical and economic feasibility. 3 lectures, 1 laboratory.
<b>Prerequisite Courses:</b>	ME 328
<b>Prerequisites by Topic:</b>	Design for Strength and Stiffness
<b>Textbook:</b>	<u>Shigley's Mechanical Engineering Design</u> , 11 <sup>th</sup> ed., R.G. Budnyas and J.K. Nisbett, McGraw-Hill, 2019
<b>References:</b>	Manufacturers' catalogs, trade journals, <u>Marks' Standard Handbook for Mechanical Engineers</u> , A. Sadegh and W. Worek.
<b>Course Coordinator/Instructor:</b>	Lauren Cooper/Joseph Mello, ME Professors
<b>Course Learning Outcomes:</b>	<ol style="list-style-type: none"><li>1. Define design objectives</li><li>2. Generate ideas and concepts for mechanical designs</li><li>3. Apply engineering fundamentals to create mathematical models for the analysis and synthesis of designs.</li><li>4. Select appropriate machine elements, components and materials for mechanical systems.</li><li>5. Analyze and size selected machine components for appropriate strength, stiffness, or fatigue life.</li><li>6. Apply computer-aided engineering techniques to component and system design.</li></ol>
<b>Relationship of Course to Mechanical Engineering Student Outcomes:</b>	SO 1: Developing (D) SO 2: Developing (D) SO 3: Developing (D) SO 4: Introduce (I) SO 5: Developing (D) SO 6: SO 7: Developing (D)

**Topics Covered:** Design of power transmitting shafts  
Kinematic analysis and design of gear trains.  
Design and selection of gears.  
Analysis and selection of threaded fasteners and bolted joints  
Design of riveted, welded or bonded joints  
Properties of hydrodynamic bearings  
Analysis and selection of rolling element bearings  
Design of springs  
Design and analysis of clutches and brakes

**Laboratory Activities:** Team effort on assigned projects which require problem evaluation, literature search, idea generation, modeling and analysis, computer aided engineering, and generation of assembly drawings.  
Mechanical system design projects integrate lecture topics.

**Class/Lab Schedule:** Three 50-minute lecture per week; One 170 minute lab per week

**Contribution of Course to Meeting the Professional Component:**

(a) College-level math and basic sciences:	0 credits
(b) Engineering Topics:	4 credits
Design:	Yes
(c) General Education:	0 credits
(d) Other:	0 credits

**Prepared by:** Lauren Cooper/Joseph Mello  
**Date:** 10/24/19

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