**TO:** The Engineering Faculty

FROM: The Faculty of the School of Mechanical Engineering

RE: Course Revision – ME 35200 Machine Design I

The Faculty of the School of Mechanical Engineering has approved the following course revision. This action is now submitted to the Engineering Faculty with a recommendation for approval.

## FROM:

ME 35200 Machine Design I, Sem. 1, 2, SS, Class 3, Lab 1, Cr. 4. Prerequisites: ME 263, ME 274, and ME 323.

Introduction to the principles of design and analysis of machines and machine components. Design for functionality, motion, force, strength, and reliability. The laboratory experience provides open-ended projects to reinforce the design process.

## TO:

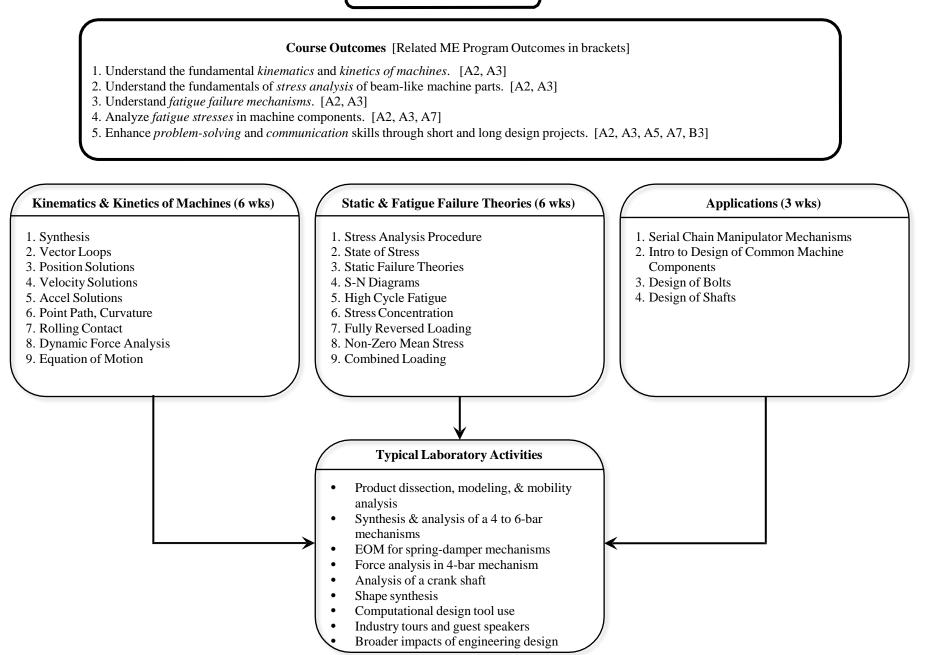
ME 35200 Machine Design I, Sem. 1, 2, SS, Class 3, Lab 1, Cr. 4. Prerequisites: ME 263, ME 374, and ME 323.

Introduction to the principles of design and analysis of machines and machine components. Design for functionality, motion, force, strength, and reliability. Review of fatigue failure theories and analysis of fatigue stresses. Laboratory experience provides open-ended projects to reinforce the design process.

**Reason:** Since ME452 is no longer a restricted elective and the design faculty believe that the students graduating from ME should have a background in machine element fatigue, the faculty members believe a review of fatigue failure theories and analysis of fatigue stresses should be included in the core class (ME 352).

James D. Jones, Associate Head/Professor School of Mechanical Engineering

## ME 352 MACHINE DESIGN I



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COURSE NUMBER: ME 352	COURSE TITLE: Machine Design I
REQUIRED COURSE OR ELECTIVE COURSE: Required	TERMS OFFERED: Fall, Spring and Summer
<b>TEXTBOOK/REQUIREDMATERIAL:</b> Hall, A.S., Jr., <i>Notes on Mechanism Analysis</i> , Waveland Press, 1981. R.G. Budynas and J. Keith Nisbett, <i>Shigley's Mechanical Engineering Design</i> , 8 <sup>th</sup> ed, McGraw-Hill, 2007.	<b>PRE-REQUISITIES:</b> ME 263 Introduction to Mechanical Engineering Design, Innovation, and Entrepreneurship         ME 274       Basic Mechanics II         ME 323       Mechanics of Materials
COORDINATING FACULTY: TBD	
<b>COURSE DESCRIPTION:</b> Introduction to the principles of design and analysis of machines and machine components. Design for functionality, motion, force, strength and reliability. The laboratory experience provides openended projects to reinforce the design process.	<ul> <li>COURSE OUTCOMES [Related ME Program Outcomes in brackets]:</li> <li>1. Understand the fundamental kinematics and kinetics of machines. [A2, A3]</li> <li>2. Understand the fundamentals of stress analysis of beam-like machine parts. [A2, A3]</li> <li>3. Understand fatigue failure mechanisms. [A2, A3]</li> <li>4. Analyze fatigue stresses in machine components. [A2, A3, A7]</li> <li>5. Enhance problem-solving and communication skills through short and long design projects. [A2, A3, A5, A7, B3]</li> </ul>
ASSESSMENTS TOOLS:1. Weekly homework.2. Design reports.3. Laboratory projects.4. Exams and Quizzes.5. Comprehensive final exam.	
<b>NATURE OF DESIGN CONTENT:</b> Linkages and shafts are designed to meet machine performance requirements. Analytical models are developed to evaluate the generality of the designs; these models are exercised to explore for improved designs.	<ul> <li><b>RELATED ME PROGRAM OUTCOMES:</b></li> <li>A2. Engineering fundamentals</li> <li>A3. Analytical skills</li> <li>A5. Open-ended design problem solving skills</li> <li>A7. Work effectively in the global engineering profession</li> <li>B3. Communication</li> </ul>
<ul> <li>PROFESSIONAL COMPONENT:</li> <li>1. Engineering Topics: Engineering Science – 2 credits (50%) Engineering Design – 2 credits (50%)</li> </ul>	
<b>COMPUTER USAGE</b> : Several of the lab projects require students to write computer programs to conduct analysis studies for their design projects.	
<ul> <li>COURSE STRUCTURE/SCHEDULE:</li> <li>1. Lecture - 3 days per week at 50 minutes</li> <li>2. Laboratory - 1 day per week at 160 minutes.</li> </ul>	
PREPARED BY: Capelleri, Hess, Panchal	<b>REVISION DATE:</b> March 27, 2018