MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 328 Introduction to Design (4 Units) Required

Course Description: (2013-15 Catalog)	Design of machine parts by stress and deflection. Effects of fluctuating stresses and stress concentration. Design of shafts and other machine parts. Modern industrial design practice using standard components and design layout drawings. 3 lectures, 1 laboratory.
Prerequisite Courses:	CE 207; ME 251; MATE 210; CSC 231 or CSC 234; ME 212; ME 234; and ENGL 149. Concurrent: IME 141 or IT 341.
Prerequisites by Topic:	Strength of materials Engineering drafting Material sciences Computer programming Engineering statics and dynamics Philosophy of design Technical writing Manufacturing techniques/processes (concurrent permitted)
Textbook:	Shigley, J. E., Mechanical Engineering Design, 9th ed., McGraw-Hill Co., 2011.
References:	Manufacturer's catalogs, internet
Course Coordinator/Instructor:	Peter Schuster, Professor of ME
Course Learning Outcomes:	1. Select appropriate materials and failure criteria for mechanical components in specified applications. 2. Design mechanical components based on material strength and stiffness constraints. 3. Describe the strengths and limitations of numerical stress and deflection predictions. 4. Estimate appropriate design factors and stress concentrations. 5. Design mechanical components for cyclic (fatigue) loading conditions. 6. Formulate detailed engineering reports documenting the design of mechanical components.

Relationship of Course to MECHANICAL ENGINEERING Program Outcomes:												
A	*b*	*c*	*d*	*e*	*F*	*g*	*h*	*i*	*j*	*K*	*l*	*m*
H	**L**	**H**	**M**	**H**	**M**	**H**	**M**	**H**	**L**	**H**	**H**	**H**

Topics Covered:

Design Process (problem definition, creativity, concurrent engineering, structural analysis)
Stress Analysis (axial, shear, torsion, bending, combined, contact, pressure vessels, stress concentrations, FEA)
Strain and Deflection Analysis (beams, curved members, buckling)
Materials & Failure Criteria (selection, properties, design factors, design for strength, design factors,)
Fatigue Analysis (infinite & finite cycles, design for fatigue)

Laboratory Projects:

Team-based lab projects applying the topics above to design practice.

Class/Lab Schedule:

Three 50-minute lectures 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:	3 credits
Design:	1 credit
(c) General Education:	0 credits
(d) Other:	0 credits

Prepared by:
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Date:
11/5/13