

School of Engineering and Computer Science
Mech 314: Design Process

Catalog Data:	Mech 314 Design Process ; 3 credits [M] Design process, design projects, engineering economics, and ergonomics. The course makes extensive use of CAD. This is a writing-in-the-major course.
Class Schedule:	Three 50-minute lecture sessions per week, for one semester.
Laboratory Schedule:	None
Prerequisites by Course:	Mech 215, completed writing portfolio or c//.
Prerequisites by Topic:	Certified major in engineering, CE 215, completed writing portfolio or c//.
Required Texts:	Eggert, Rudolph, J., <i>Engineering Design</i> , 2005, Prentice-Hall Publishing Company. Shigley, J.E., Budynas, R.G., and Nisbett, J.K., <i>Mechanical Engineering Design</i> , 8 th Edition, 2008, McGraw-Hill Publishing Company.
Reference(s)	Hyman, Barry, <i>Fundamentals of Engineering Design</i> , Third Edition, 2003, Prentice-Hall Publishing Company. Dieter, George, <i>Engineering Design: A materials and Processing Approach</i> , Third Edition, 2000, McGraw-Hill Publishing Company.
Course Coordinator:	Dr. Hamid Rad
Course Objectives:	<ol style="list-style-type: none"> 1. Introduce engineering design process. 2. Develop skills in application of engineering principles to open-ended projects. 3. Learn to effectively communicate engineering designs, both verbally and in writing. 4. Learn fundamentals of engineering economics. 5. Use energy method to analyze two- and three-dimensional components under combined loadings. 6. Introduce failure theories for mechanical design.
Topics Covered:	<ol style="list-style-type: none"> 1. Design Process. 2. Reverse Engineering. 3. Project Management. 4. Design of Experiments. 5. DFM/Ergonomics, Teamwork-Ethics. 6. Engineering economics. 7. Oral and Written Project Reports. 8. Concepts of stress-strain and deflection due to axial, torsional, bending, and combined loading conditions. 9. Introduce strain energy method. 10. Design of curved beams. 11. Failure Theories for static and dynamic loadings.
Lab Experiments and Activities:	None

Course Outcomes:	Students will be able to:		
	Assessed for Program Outcomes	C-1.	Analyze needs to produce problem definition for mechanical systems.
		C-2.	Carry out design process (such as concept generation , modeling, evaluation, iteration) to satisfy project requirements.
C-3.		Work within realistic constraints, (such as economical, environmental, social, political, manufacturability, safety, ethical) in realizing systems.	
F-1.		Evaluate ethical issues that may occur in professional practice using professional codes of ethics.	
G-1.		Produce progress reports, memos, project reports both formal and informal, recording and maintaining an engineering journal.	
H-1.		Recognize the societal and global changes that engineering innovations may cause.	
H-2.		Examine economic tradeoffs in engineering systems.	
Other	A-2.	Make decisions based on design of mechanical systems using engineering fundamentals they learn in this course.	
	A-3.	Apply engineering principles in analysis and design of mechanical components/systems to meet desired needs.	
	D-1.	Share responsibilities and information on schedule with others on the team.	
	D-2.	Participate in the development and selection of ideas.	
Required or Elective Course:	Required		
Contribution to Professional Component:	Engineering Topics		
Relationship of Course to Program:	Meets: Educational Objectives <u>1, 2, 3, 4</u> Program Outcomes <u>A, C, D, F, G, H</u>		
Prepared by:	Dr. Hamid Rad	Date:	October 10, 2008
Approved by CAC:			