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Department of Mechanical Engineering	
Machine Design I (67317)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : Mechanics of Materials (1) (67311) OR Mechanics of Materials (61207) P2 : Mechanics of Machinery (67323) OR Theory of Machines (67310) OR Dynamics (67210) OR Dynamics (61211) OR Machine Design I (67411)

Course Contents

Introduction to design process. Design considerations. Tolerances, fits and surface finish. Stress analysis and deflection of mechanical elements. Energy methods. Statistical considerations in machine design. Design of screws, fasteners. Failure and fatigue of machine elements. Students in individual or groups should perform short projects to practice the main principles of the courses.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	At the end of this course students should be able to; Identify stress states and calculate stresses at different points in common machine elements.	E	35 %
2	Calculate deflections of common structural/machine elements.	A	15 %
3	Apply basic principles of static and dynamic failure theories.	E	30 %
4	Design some common machine elements and prevent their failure due to different types of stresses.	C	20 %

Textbook and/ or Refrences

1. Budynas-Nisbett, Shigleys Mechanical Engineering Design, 9th Edition, McGraw Hill, 2011. 2. M. F. Spotts, T. E. Shoup, L. E. Hornberger, Design of Machine Elements, 8th edition, Pearson Education, Inc., 2004.

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Quizzes	10 %
Final Exam	50 %

Course Plan

Week	Topic
1	Introduction to Mechanical Engineering Design
2 to 4	Load and Stress Analysis
5 to 7	Deflection and Stiffness
8 to 9	Failures Resulting from Static Loading
10 to 13	Fatigue Failure Resulting from Variable Loading
14-15	Shafts and Shaft Components
16	Review, Final Exam