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Department of Mechanical Engineering	
Finite Elements (67513)	
Total Credits	**3**
major elective	
Prerequisites	P1 : Mechanical Vibrations (67414) P2 : Machine Design I (67317)

Course Contents

Fundamental Concepts, One-Dimensional Problems,Trusses,Beams and Frames,Vibrations of Rods and Beams,Two-Dimensional Problems

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Understand the fundamentals of finite element analysis concepts	E I	5 %
2	Calculate stresses and deflections for 1-dimensional elements including trusses	A D E	25 %
3	Calculate mechanical and thermal deflections and stresses for beams at different loading conditions.	A D E	20 %
4	Solve plane stress and plane strain problems.	A D E	15 %
5	Calculate the eigenvalues and eigenvectors for rods and beams	A D E	15 %
6	Use a finite element analysis software to solve mechanical engineering problems (ABACUS, Algor, ANSYS,)	C D K	20 %

Textbook and/ or Refrences

T. R. Chandrupatla and A. D. Belegundu, Introduction to Finite Elements in Engineering, Second edition,Prentice-Hall, 1998M. A. Bhatti, Fundamental Finite Element Theory Applications, John Wiley, 2005.D. L. Logan, A Fist Course in the FinElement Method, Third Edition, Thomson Learning, 2002

Assessment Criteria	Percent (%)
First Exam	25 %
Second Exam	25 %
Final Exam	50 %

Course Plan

Week	Topic
1	Introduction
2,5	One-Dimensional Problems
null	First Exam
6,7	Trusses
8,9	Beams and Frames
10,12	Vibrations of Rods and Beams
null	2.Exam
13,15	Two-Dimensional Problems
16	Review, Final Exam