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Department of Civil Engineering	
Structural Analysis III (61401)	
Total Credits	**3**
major elective	
Prerequisites	P1 : Structural Analysis II (61317) OR Structural Analysis II (61316)

Course Contents

This course focuses on the analysis of statically indeterminate structures (trusses, beams grids, frames, plates and shells) using finite element method. Introduction to dynamic and stability of structures. Computer applications.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Apply F.E. theory to axial, flexure and torsional elements.	A E	30 %
2	Analyze structures for static loads (trusses (2D,3D), beams, grids, frames (2D,3D)).	A E K	40 %
3	Extrude 1D elements to 2D and 3D elements.	K	5 %
4	Analyze structures for simple dynamic loads.	A E K	15 %
5	Analyze structures for stability loads.	A E K	10 %

Textbook and/ or Refrences

1. Logan D.L. A First Course in the Finite Element Method, fourth edition, THOMSON, 2007. 2. Clough, Ray W. and Penzien, Joseph "Dynamics of Structures", third edition, computers and structures, Inc., 2003. 3. Structural Analysis and Design Program SAP2000, version 14, Computers and structures, 2008.

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Projects	20 %
Final Exam	40 %

Course Plan

Week	Topic
1	Introduction to Finite Element method.
2	Theory of Finite Element
3	Applications of Finite Element theory to axial elements
4	Two and three dimensional trusses
5	Ways of reducing DOFs
6	Application of Finite Element theory to bending elements
6	MIDTERM EXAM 1
7	Application of Finite Element theory to frame elements
8	Application of Finite Element theory to shafts
9	Application of Finite Element theory to grids
10	Application of Finite Element theory to space frames
11	Application of Finite Element theory to plates and shells
11	MIDTERM EXAM 2
12	Response of single degree of freedom systems to dynamic loads
13	Response of structures to dynamic loads
14	Stability analysis of simple structures
15	Review