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Department of Civil Engineering

Structural Analysis I (61315)

Total Credits	**3**

major compulsory

Prerequisites	P1 : Mechanics of Materials (61212) OR Mechanics of Materials (61207)

Course Contents

Review of Basic Principles of Statics: equilibrium equations, static determinacy. Analysis of Statically Determinate Beams &Frames: shear &bending moment diagrams. Analysis of Statically Determinate Plane Trusses: method of joints &method of sections, applications. Cables &Arches: analysis of cables, three-hinged arch, applications. Deflections: moment area method, conjugate beam method, virtual work, applications to beams, frames &trusses. Influence Lines for Statically Determinate Structures.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Ability to use equilibrium equations in calculating reactions at supports of determinate structures.	A	10 %
2	Ability to analyze determinate beams and frames.	A	10 %
3	Ability to draw axial force, shear force, and bending moment diagrams for beams and frames.	A	15 %
4	Ability to analyze plane and space trusses.	E	15 %
5	Ability to analyze cables and arches.	E	10 %
6	Ability to draw elastic curves and calculate slopes and deflections for determinate structures.	E	25 %
7	Ability to draw influence lines for statically determinate structures	E	15 %

Textbook and/ or Refrences

1. Structural Analysis, 7th Edition in SI Units, R. C. Hibbeler, Prentice Hall, 2009. 2. Aslam Kassimali, Structural Analysis, Fourth Edition, 2011 3. Fundamentals of Structural Analysis, By H. H. West, Wiley,1993 4. Intermediate Structural Analysis, By C. K. Wang, McGraw Hill, 1983. 5. Structural Engineering, Volume 2: Indeterminate Structures, R.N.White, P.Gergely, R.G. Sexsmith, Wiley, 1975. 6. Computer Assisted Structural Analysis and Modeling, M.Hoit, Prentice Hall, 1995 7. Matrix Structural Analysis, L.P.Felton, R.B.Nelson Wiley, 1997

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

Course Plan

Week	Topic
1	Review of Basic Principles of Statics
2 &3	Analysis of Statically Determinate Beams &Frames
4 &5	Analysis of Statically Determinate Plane Trusses
6 &7	Cables &Arches
8,9, 10, 11, &12	Deflections
13, 14 &15	Influence Lines for Statically Determinate Structures