

Course	CE 37500 – Structural Analysis
Type of Course	Required for Civil Engineering Program
Catalog Description	Stress resultants (reactions and internal forces) for trusses, beams, frames, arches, and cables. Deflections of beams and frames by geometric methods (moment-area theorems & conjugate beam analogy). Analysis of statically indeterminate beams and frames using approximate methods and the slope deflection method. Influence functions and their applications.
Credits	3
Contact Hours	3
Prerequisite Courses	CE 25200
Corequisite Courses	None
Prerequisites by Topics	Strength of Materials
Textbook	R.C. Hibbeler, <i>Structural Analysis</i> , Prentice Hall Publishing Company, Current Edition.
Course Objectives	To introduce the students to concept of global structural stability, theory of structural analysis, and methods in structural analysis.
Course Outcomes	Students who successfully complete this course will be able to: <ol style="list-style-type: none">Distinguish between stable and unstable and statically determinate and indeterminate structures. (1)Apply equations of equilibrium to structures and compute the reactions. (1)Derive the shear and bending moment equations. (1, 6, 7)Draw the shearing force and bending moment diagrams. (1, 6, 7)Calculate the internal forces in cable and arch type structures. (1, 6,7)Evaluate and draw the influence lines for reactions, shears, and bending moments in beams and girders due to moving loads. (1, 6, 7)

- g. Use approximate methods for analysis of statically indeterminate structures. (1, 6, 7)
- h. Calculate the deflections of truss structures and beams. (1, 6, 7)
- i. Apply the slope-deflection method to analyze statically indeterminate structures. (1, 6, 7)
- j. Ability to model and analyze structural systems with computational software package. (1, 6)

Lecture Topics

- 1. Types of Structures and Loads
- 2. Analysis of Statically Determinate Structures
- 3. Analysis of Statically Determinate Trusses
- 4. Internal Loads Developed in Beams and Frames
- 5. Cables and Arches
- 6. Influence Lines for Statically Determinate Structures
- 7. Approximate Analysis of Statically Indeterminate Structures
- 8. Deflections
- 9. Displacement Method of Analysis: Slope-Deflection Equations

Computer Usage

Moderate

Laboratory Experience

None

Design Experience

Low

Coordinator

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Date

1 July 2018