THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Structural Analysis

CIVILEN 4310

Credit Hours:
3.00 - 3.00

Course Levels:
Undergraduate (1000-5000 level)

Course Components:
Lecture

Course Description:
Deflection in trusses, beams, and frames. Solution of Indeterminate Structures by methods of consistent deformations and moment distribution. Beam and truss analysis using stiffness method.

Prerequisites and Co-requisites:
Prereq: 3310 (431).

Course Goals / Objectives:
- Be skilled in the calculation of deflection of beams, trusses and frames
- Be able to analyze statically indeterminate structures using the flexibility methods such as method of consistent deformation
- Be able to analyze statically indeterminate structures using the stiffness methods and moment distribution method

Course Topics:

- Principle of Virtual Work: Deflection of Trusses by Virtual Work Method Deflection of Frames by Virtual Work Method
- Analysis of Statically Indeterminate Structures by the Force Method: Force Method of Analysis: General Procedure; Maxwell’s Theorem of Reciprocal Deflection; Betti’s Law; Force Method of Analysis: Beams; Force Method of Analysis: Frames
- Influence Lines for Statically Indeterminate Beams
- Approximate Analysis of Statically Indeterminate Structures Portal method, Cantilever method
- Moment Distribution Method:Moment Distribution for Beams; Stiffness-Factor Modifications; Moment Distribution for Frames: No Sidesway; Moment Distribution for Frames: Sidesway
- Truss analysis using stiffness method: Member stiffness matrix; Displacement and force transformation matrices; Truss stiffness matrix
- Frame analysis using stiffness method: Member and structure stiffness matrices and applications

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Designation:
Elective