

*ABET Course Syllabus***Course Information, Textbook and Supplementary Materials**

**Course Description:** Deformations and deflections of elastic systems; statically indeterminate beams, arches, and frames; secondary stresses.

**Required for:** BSCE, BSCE-Structural, BSCE-Bldg. Science, and BSCE-Environmental

**Prerequisite:** CE 225 Mechanics of Deformable Bodies

**Co-Requisite:** None

**Required Textbook:** Elementary Theory of Structures, Y. Y. Hsieh, Prentice Hall, Englewood Cliffs, New Jersey 07632 (Third or later edition).

**Reference:** None

Topics Covered	Learning Outcomes
Stability, determinacy and in general the nature of constraints of structures Composite structures	<p><b>Students will be able to do the following:</b></p> <ol style="list-style-type: none"> <li>1. Identify static determinacy versus static indeterminacy</li> <li>2. Select the required number of unknown (equations) to solve the problem</li> <li>3. Distinguish between internal and external determinacy or indeterminacy of the problem</li> </ol>
Elastic deformations Beams Deflection equations Unit load method for beams, frames and trusses	<p><b>Compute:</b></p> <ol style="list-style-type: none"> <li>4. Deformed shape of beams using the differential equation</li> <li>5. Deflections of a point using unit load method</li> <li>6. Deflections at a point using conjugate beam method</li> <li>7. Deflections using Castigliano's Theorem</li> </ol>
Method of consistent deformations Frames	<ol style="list-style-type: none"> <li>8. Determine the unknown forces using the method of consistent deformations for beams, frames and trusses</li> </ol>
Slope deflection method Method of joints and sections Shear and Bending Moment	<ol style="list-style-type: none"> <li>9. Compute joint rotations, solve for the moments at all joints</li> <li>10. Compute reactions using the slope deflection method</li> </ol>

Moment-distribution method and applications for one and two translations Conjugate beams	11. Determine moments at joints of statically indeterminate structures using the Moment-distribution method.
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**CE 358**

**Theory of Structures I**

**3 Units**

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Lecture and Lab Schedule			
Lecture		Lab	
Sessions per Week	Duration per Session	Sessions per Week	Duration per Session
2	1.5 hours	n/a	

**Relation of Course Objectives to Program Outcomes**

The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.

This course does not contribute to the program outcomes.

Course Contribution to Program Outcomes (a-k)	✓ Key
n/a	

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