



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Behavior of Structural Element

CIVILEN 4340

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Course Description:

Mechanics of beams - symmetrical bending and unsymmetrical bending; shear stresses and shear center for thin flange beams; buckling of columns; pressure vessels and combined loadings.

Prerequisites and Co-requisites:

Prereq: 3310 (431).

Course Goals / Objectives:

- To provide basic understanding of advanced topics in structural element behavior in case of symmetrical and unsymmetrical bending, and inelastic bending of beams
 - To provide basic understanding of shear distribution and shear center location in thin walled beams
 - To provide basic understanding of buckling response of columns under concentric and eccentric loadings, and elastic-plastic buckling
 - To provide basic understanding of response of pressure vessels under internal pressure, and combined loadings
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Course Topics:

- Analysis of 3-dimensional states of stresses and strains- abrief review
 - Stresses in Beams- pure and non-uniform bending; non-prismatic beams; shear stresses for rectangular and circular crosssections, and webs of beams with flanges.
 - Stresses in composite beams, bending of unsymmetrical beams;doubly symmetric beams with inclined loads;shear stresses and shear centers in thin walled open cross sections; shear stresses in wide flange beams; elastoplastic bending of beams.
 - Columns-Buckling and stability; columns with eccentric axial loads; elastic and inelastic behavior of columns,inelastic buckling; design of columns.
 - Pressure vessels- spherical and cylindrical; combined loadings
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Designation:

Elective