

CE2020 - Structural Analysis

Credit Distribution: C:11 L:3 T:1 P:0 E:1 O:6 TH:0

Course Type: Theory

Description: To facilitate understanding of the basic behavior of skeletal structures and their responses to applied loading. To help develop analytical skills required to determine support reactions, internal forces, and displacements of simple frames and trusses. To visualize deformation and force flow in linear elastic structural systems composed of skeletal members using concepts of equilibrium of forces, compatibility of deformations, and force-displacement relations. To comprehend the design actions that come on structures, and the resistance required from constituent members for structural design.

Course Content:

- Introduction to Structural analysis of structures, load, and response.
- Force response in statically determinate structures, support reactions, Internal force in trusses, beams, frames, and funicular systems (arches and cables); Influence lines using direct equilibrium and principle of virtual displacements
- Displacement response in statically determinate structures, basic energy methods, deflection in trusses and beams, conventional methods, and principle of virtual work
- Analysis of statically indeterminate structures Introduction, method of consistent deformations theorem of least work; Introduction to displacement methods.

Text Books:

- Menon, D., Structural Analysis, Narosa Publishing House, 2008

Reference Books

- Hibbler, R.C., Structural Analysis, 7th edition, Prentice Hall, 2008
- Norris, C.H., Wilbur, J.B., and Utku, S., Elementary Structural Analysis, TMH, 2003
- Wang, C.K., Intermediate Structural Analysis, McGraw Hill, 1983

Prerequisite: NIL