



Course Name:

Nonlinear Modeling of Structures

Course Number: 20-022	Credit: 3
Program: Graduate	Course Type: Technical Selective
Prerequisite: -	Corequisite: -

Course Description (Objectives):

This course introduces fundamental concepts of numerical modeling and nonlinear analysis of structures and materials, including nonlinear element behavior, numerical solution methods and dynamic analysis.

Course Content (outline):

- Chapter 1: An overview on matrix structural analysis
- Chapter 2: Nonlinear behavior of truss element
- Chapter 3: Numerical procedures
- Chapter 4: Nonlinear behavior of beam element (fiber- hinge)
- Chapter 5: Dynamic nonlinear analysis of beam elements
- Chapter 6: Great Displacements

References:

- Bathe, K.J. (1996), Finite Element Procedures, Prentice Hall, Englewood Cliffs, NJ.
- McGuire, W. (1999), Matric structural analysis, Wiley
- Crisfield M. A. (1996), Non-linear finite element analysis of solids and structures, Wiley
- Chen W. F. (1985), Soil Plasticity: Theory and Implementation, Elsevier Science
- Chen W. F. (1981), Plasticity for structural engineers, Springer
- Owen D. R. and Hinton E. (1981), Finite elements in plasticity, McGraw hill
- Simo J.C. and Hughes T.J.R. (1997), Computational Inelasticity, Springer