

Finite Element and Boundary Element Methods -ME434 & ME613

(3-0-0-6)

Instructor: Salil S. Kulkarni (Room ME – 320)
email: salil.kulkarni@iitb.ac.in

Course Contents

Part 1: Finite Element Method

Introduction to Finite Elements, FEM applied to discrete systems, Method of weighted residuals, FEM applied to one-dimensional linear static problems, FEM applied to two-dimensional linear static problems – scalar and vector field problems, introduction to dynamic problems.

Part 2: Boundary Element Method (If time permits)

BEM to solve steady state heat conduction problems.

Textbooks:

1. Cook, R. D., Malkus, D. D. and Plesha, M. E., Concepts and Applications of Finite Element Analysis
2. Seshu, P., Textbook of Finite Element Analysis

References

1. Chandrupatla, T. R. and Belegundu, A. D., An Introduction to the Finite Element Method in Engineering
2. Reddy, J. N., An Introduction to the Finite Element Method
3. Bathe, K. J., Finite Element Procedures.
4. Hughes, T. J. R. The Finite Element Method – Linear Static and Dynamic Finite Element Analysis.
5. Brebbia, C. A. and Dominguez, J., Boundary Elements an Introductory Course, freely available at <http://www.boundaryelements.com/>

Assessment Scheme

Mid semester Exam: 25%
Quiz (3 to 4 quizzes): 15%
Assignment (individual): 10%
Project (in groups of three): 10%
Final Exam: 40%

Office Hours

Room ME320, By appointment only. Please send me an email if you wish to meet me.

Academic Integrity:

All the assignments, including the computer assignments, need to be done individually. Students can discuss the assignments with colleagues and refer to all the available resources, but any such help should be cited. The students are expected to refrain from cheating and plagiarism while solving the exams and working on the assignments and the project. In case a student is found to indulge in any such activity, the case will be referred (DAC) for further action.