

CE 33500 Computational Methods in Civil Engineering

Description: Algorithmic formulation of the solution to civil engineering problems. Flowcharts. Solutions to algebraic and differential equations common to civil engineering. Matrix problems. Differentiation and integration. Optimization problems. Students will primarily use microcomputers and a programming language, spreadsheets and “macros” and symbolic calculations software.

Code and Section: 23421/23450, 2RR-LEC/2RR2-LEC

Prerequisites: CSc10200, CE26400, Math 39100 (min. C grade), CE33200; Coreq: Math39200.

Textbook: An Introduction to Numerical Methods and Analysis. James F. Epperson. Wiley, 2 edition (October 7, 2013), ISBN-13: 978-1118367599

Reference book: Numerical Methods for Engineers and Scientists, Amos Gilat, Vish Subramaniam. Wiley, 3 edition (October 14, 2013), ISBN-13: 978-1118554937.

Time and location: M, 6:30-8:20 pm, BH-106; Wed, 6:30-8:20, ST207

Instructor: Prof. Hansong Tang

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Grading:

Homework (&attendance):	10%
Quizzes:	15%
Three exams:	30%
Project:	15%
Final:	30%

Content

1. Introductory concepts and calculus review
2. Root-finding
3. Interpolation and approximation
4. Numerical integration
5. Numerical methods for ODE
6. Numerical methods for solution of systems of Eqs.
7. Approximate solution of algebraic eigenvalue problems.