Spring 2023

CE 402   **COMPUTER METHODS IN ENGINEERING**

Instructor:	S.F. Masri; KAP 206A; email: *masri@usc.edu*
Office Hours:	Monday: 11:00 am - 1:00 pm, Tuesday: 1:00 - 2:00 pm
Telephone:	740-0602; 740-0603
Teaching Assistant:	(To be announced)
T.A. Office Hours:	(KAP 239) W 1:00-2:00 p.m., Th 1:00-2.00 p.m., and F 1:00-2.00 p.m.
Class No.	29638R
Time & Place: Lecture	Tuesday, 11:00 a.m. - 12:50 p.m.; (MRF 229)
Textbook:	"Numerical Methods for Engineers" (Eighth Ed.)
	by: S.C. Chapra & R.P. Canale (McGraw-Hill)
Prerequisite:	CE 108: "Introduction to Computer Methods in Civil Engineering"
	MATH 245: "Mathematics of Physics and Engineering"
Drop Dates:	7-APR-2023 with "W"
Final Exam:	Tuesday, 09-MAY-2023, 11:00 a.m. - 1:00 p.m.
Grades:	Homework/Midterm/Final: 20% / 30% / 50%
Remarks:	About 8 homework projects will be assigned

Late Homework will not be accepted.
No make-up on any examinations.

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1. Introduction - Course Overview; Flowcharts

2. Software Tools - Mathematical Computation Software (Fortran, C, Python, Matlab, Mathematica, R)

3. Solution of Nonlinear Algebraic Equations

4. Solution of Sets of Equations (Linear and nonlinear)

5. Optimization

6. Interpolation

7. Numerical Differentiation

8. Numerical Integration

9. Numerical Solution of Ordinary Differential Equations

10. Boundary-Value Problems and Characteristic-Value Problems

11. Finite-Difference Methods for Partial Differential Equations

12. Curve-fitting and Approximation of Functions