UNIVERSITY OF SOUTHERN CALIFORNIA
Department of Civil and Environmental Engineering

Spring 2022

CE 402 **COMPUTER METHODS IN ENGINEERING**

Instructor:	S.F. Masri; KAP 206A; email: *masri@usc.edu*
Office Hours:	Monday: 2:00 - 3:30 pm, Wednesday: 2:00 - 3:30 pm
Telephone:	740-0602; 740-0603
Teaching Assistant:	Jinwoo Im email: jinwooim@usc.edu
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	Monday, 11:00 a.m. - 12:50 p.m.; (Zoom / WPH B26)
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:	8-APR-2022 with "W"
Final Exam:	Wednesday, 04-MAY-2022, 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