

MEGR 2240 – Computational Methods for Engineers

Professor: J. M. Hill

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Web Site:	http://webpages.uncc.edu/~hill
Office Hours:	Monday and Wednesday: 4:00 – 5:00 Tuesday and Thursday: 1:00 – 2:00
Catalog Data:	MEGR 2240 Computational Methods for Engineers (3) Development and debugging of computer programs using Matlab Numerical Methods, their errors and stability. (Fall, Spring).
Textbooks(s):	Numerical Methods w/Matlab, any edition, Chapra, John Wiley & Sons, 2008. ISBN 0-13-227271-7 This textbook is optional, but is a good reference.
Goals:	The goal of this course is to provide the students with the necessary skills to solve engineering problems using computer programming.
Prerequisites:	Prerequisites: Calculus III and Statics, both with a grade of C or better.
Topics:	Computer Languages Representation of Data Logical Structure of Programs Program Flow Control Data Input and Output Numerical Techniques for: 1. Integration and Differentiation 2. Interpolation and Extrapolation 3. Root finders 4. Solving 1st and 2nd order ordinary differential equations 5. Solving Systems of Equations 6. Least Squares and Other Fits Debugging Tools and Techniques Error Bounds for Numerical Methods
Outcomes/Objectives	As the conclusion of this course, the students will be able to: Reduce engineering problems to a form suitable for program implementation. Select appropriate data types and programming methods for different problems. Develop and debug computer programs in Matlab Develop suitable documentation to accompany programs. Understand errors that can occur in the numerical solution of engineering problems
Computer Usage:	Assignments will require the use of Mosaic and/or other computing services to develop and debug computer programs.
Grading:	2 one-hour and 15 min exams in-class, each worth 24% of the final grade. Quizzes given in the computer lab worth a total of 18% of the final grade. One 2 ½ hour comprehensive final exam worth 24% of the final grade, with homework, in-class theory quizzes and take-home programs making up the final 10%.
Follow-up courses:	This course will be required for Junior-level courses.
Course Policy:	Homework and programs will not be accepted after the solutions have been presented in class. If a test, quiz or homework is missed because of illness or emergency, a grade of zero will be recorded unless the absence is <i>excused by the office of the Dean of Students</i> . Other than calculators, the use of electronic devices (cell phones, mp3 players, iPods, etc.) is not allowed. iPads and other tablets may be used for note-taking. ► Absolutely no texting during class. ◀
Academic Integrity:	Students have the responsibility to know and observe the requirements of the UNCC Code of Student Academic Integrity (https://legal.uncc.edu/policies/up-407). Students are encouraged to work together in formulating a plan for the solution of homework problems, but each student must do his or her own work for the actual solution that is submitted for a grade. Copying of homework or computer source code will be considered an honor code violation.
Calculator Policy:	The only calculators allowed for use on tests, quizzes, or on the final exam are those listed on the National Council of Examiners for Engineering and Surveying (NCEES) site at https://ncees.org/exams/calculator/ . These are the calculators allowed on the FE exam.

