



MATH 446 / OR 481 Syllabus

Instructor: Tim Sauer
Office: 4209 Exploratory Hall
Hours: TR 1:30 - 3 pm
Phone: 703 993-1471
Email: tsauer@gmu.edu
Web Page: <http://math.gmu.edu/~tsauer>

Prerequisites: MATH 203 and CS 112

Text: [*Numerical Analysis*](#), by T. Sauer, THIRD EDITION, Pearson 2018

It is important to have access to the textbook, for assigned reading and for access to homework exercises. Don't make me feel bad by purchasing a new copy -- there are plenty of used copies floating around, or borrow one from a friend who already took the class.

Text Website: Useful Matlab files are available at
https://media.pearsoncmg.com/aw/aw_sauer_num_analysis_3/main.html

Class schedule: The schedule on Blackboard is the home for all class activities. Before each class meeting at 3pm TR, the student is responsible for reading the assigned sections of the text and viewing the assigned videos. Each video is connected to a Checkup, which consists of one question that tests your basic comprehension of the assigned section. Multiple guesses (up to 5) are allowed for the Checkups. If the Checkup is completed correctly 2 hours before the class meeting, one-half bonus point will be awarded. The class meeting time will primarily be a time for questions on the material presented in the video. The textbook exercises should be attempted before class, and completed eventually after class.

Grading: Two midterm exams (50 pts. each) and the Final Exam (100 pts.) will account for most of the final grade; the remainder will depend on homework projects (20 pts. each) to be submitted to Blackboard.

Grades in the course will be based on your INDIVIDUAL effort on the exams and projects. Discussion of course topics with others is helpful and encouraged; however, all work toward the solution of homework projects submitted for credit, including computer code and written summaries, must be done SOLELY by you.

Course Goals: Design and implementation of algorithms for the solution of scientific and engineering problems. Emphasis will be placed on the written and graphical presentation of solutions.

Course Content: The course will cover the following topics

- Floating point arithmetic
- The solution of nonlinear equations in one variable
- The solution of systems of linear equations
- The solution of nonlinear systems
- Interpolation and polynomial approximation
- Curve-fitting; cubic and Bezier splines
- Least squares problems

Test Dates:

- Final Exam: Thurs., Dec. 8, 1:30 - 4:15

Computers: The software package Matlab will be used for analysis and presentation of data. Matlab is a computing environment with programming capability, good graphics, and powerful library functions. It is available to students for download or on campus in the computer labs. Matlab tutorials can be found readily on the internet. There is a pretty good one at [Mathworks](#), and another one in the textbook's appendix.