MATH 446 / OR 481 SYLLABUS

FALL 2020

Instructor: Tim Sauer
Office: 4209 Exploratory Hall
Hours: TR 1:30 - 3 pm
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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. The Checkup should be done before the class meeting. The class meeting time will not be for lecture, but will primarily be a time for questions on the material. The textbook exercises should be attempted before class, and completed eventually before the weekly quiz.

There will be Blackboard quizzes during the class meeting on most Tuesdays. A number of Matlab projects will be assigned that are due one week after assignment.

Grading: Weekly Blackboard quizzes (15 pts. each) and the Final Exam (50 pts.) will account for most of the final grade; the remainder will depend on homework projects (15 pts. each) to be submitted to Blackboard.

The weekly quizzes will normally be on Tuesdays, and must be taken during scheduled class time. The alloted time will be 1/2 hour.

BONUS POINTS: Due to the general bummer that we cannot meet in person due to the pandemic, the least the instructor can do is provide a liberal dose of possible bonus points. One

bonus point will be awarded for each correctly answered Checkup that is completed before the class meeting.

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. 10, 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 on campus in the computer labs. Alternatively, a PC version can be purchased. 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.

There are computer Labs in Innovation Hall and the Johnson Center. For hours of operation of these labs and other locations see Computing Labs Page. You may also access Matlab through the GMU Citrix Virtual Lab .

Honor Code: The University Honor Code is to be followed. Sharing information of any kind about exams or Matlab assignments will result in a grade of zero. Any violations will be submitted to the University Honor Committee.

Office of Disability Services: If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services(ODS) at 993-2474. All academic accommodations must be arranged through the ODS.