Math 478, Introduction to Partial Differential Equations and Numerical Methods, Fall, 2017

Lecturer:
Dr. E. Sander, Exploratory Hall, Rm 4408, 993-1490, *esander at gmu.edu*
(where at is replaced with @)

Lectures: Mondays and Wednesdays 12-1:15pm, Exploratory Hall 4106.

Office hours: Mondays and Wednesdays 10:30-11:30

Textbook: Evelyn Sander and Thomas Wanner, *Nonlinear Analysis and Computation for Partial Differential Equations*, Unpublished, In PDF form, Available from the Blackboard Class Site. This book is for your own use. We ask that you do not distribute this book to others.

Prerequisite: C or better in MATH 203 and 214 or 216.

Course description: This course introduces basic facts about partial differential equations, including elliptic equations, parabolic equations and hyperbolic equations. Methods of solution, characteristics, initial/boundary-value problems, and numerical approximation techniques. This includes generalized Fourier series, separation of variables, and numerical methods of solving partial differential equations, including finite difference methods and spectral methods in one and two dimensional domains for both linear and nonlinear equations of all three types.

Matlab: Computation is an integral part of the course. You will need to have access to Matlab. No prior experience is required.

Homework There will be homework assignments, which will be available from blackboard. Since written assignments are a vital part of this course, here are some standard guidelines for turning in homework. Most apply equally well to any subject, but the last one is specific to your Matlab code.

1. Staple your homework together. No loose pages, paper clips or binder clips.
2. Write the answer to each problem on a separate sheet of paper. Turn in your problems in order.
3. Review your answers for clarity and correctness before handing them in. This includes writing in *clear complete sentences using correct spelling and grammar*. Do not hand in your scratch work. Rewrite your answers neatly.
4. Please do not adopt the attitude that says, "I don't really understand how to do this problem, so I will take a shot and see if I get any points." I am always willing to give hints if you are having trouble with any particular assignment.
5. Turn your homework in on time.
6. When an assignment involves Matlab, turn in two different files via Blackboard: your code and the output of the code. Do not turn in hard copies of the Matlab - it is a waste of paper.

Test Dates

- Midterm: Wednesday, October 18.
- Final Exam: Monday, December 18, 10:30-1:15 (per official university schedule).

Grading: The grade is based on
Homework (40%)
Midterm (30%)
Final (30%)

Honor Code

- You may discuss homework problems with others. However, the writeup and coding must be entirely your own. This means that prior to handing it in *you do not show anyone your written assignment or actual code, nor do you look at anyone else's writeup or actual code*.
- You may use sources other than the textbook to help you with your assignment, but then you must cite these sources.
- No collaboration of any kind is permitted on exams. Exams are closed book, closed notes.
- Any violations will be brought ot the Honor Committee and result in a grade of F for all individuals involved. See The GMU Honor Code.

General Remarks: Please be considerate of other students in the class. Turn your cell phones off before entering the classroom. Please get to class on time. If you must arrive late or leave early sit near the door to minimize the distraction.

University Required Remarks:

- When needed, accommodations can be made through the Office of Disability Services. See me if this is relevant.
- In order to help ensure the privacy of communications with students, faculty and students need to use their Mason email accounts when corresponding with each other.
- University Catalog: http://catalog.gmu.edu/
- University Policies: http://universitypolicy.gmu.edu/
- GMU has a number of academic support and other resources to facilitate student success. These include: Learning Services, University Career Services, the Writing Center, Counseling and Psychological Services (caps.gmu.edu), Student Health Services (shs.gmu.edu), the University Ombudsperson (ombudsman.gmu.edu), and Wellness, Alcohol and Violence Education and Services (waves.gmu.edu), University Title IX Coordinator (integrity.gmu.edu). The most relevant to math classes: Computer labs on campus (no need to buy software), Patriot Computers (if want to buy software anyway), and the Math Tutoring Center. Let me know if you have trouble locating these resources.