

MATH 689/001 (Fall 2009)

Topics in Applied Mathematics

Instructor: Padmanabhan Seshaiyer

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Class Time : W 7:20pm – 10pm Venue : Science and Tech I, Room 242

Office hours : W 5:00pm – 6:30pm and by appointment

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About the course: This class will cover the application of numerical/analytical techniques and the application of computational methods for PDES to understand and solve problems that arise in multidisciplinary applications. Specifically, the plan is to teach students to (a) Develop the ability to mathematically formulate problems from a nonmathematical description; (b) Identify features relevant to a model and be able to analyze the model using analytical techniques and (c) Perform simulations using state-of-the-art mathematical software such as MATLAB to interpret the results and suggest recommendations. In summary, the primary goal of the course will be employ the philosophy of “here is the problem, find the mathematics to solve it” rather than “here is the mathematics, use it to solve the problem”. This course will provide a unique experience of how numerical/analytical techniques will be applied outside academia and also broaden the horizon beyond what is usually presented in graduate education.

Text: There will not be a particular textbook that will be used for the course. Instead, lecture notes will be updated on the course website or provided to the students on a regular basis as the semester progresses. A good reference textbook that is recommended for the class will be **Classical and Modern Numerical Analysis: Theory, Methods and Practice** by A. Ackleh, E. Allen, R. Kearfott, P. Seshaiyer (Chapman & Hall - CRC Publishing).

Grading: Your grade for this course will be based on homeworks, projects, presentations and participation in the class. More specifically, homeworks and projects given during the semester will total 50% of your grade. Completed projects must be written in the form of a journal publication including statement of the problem, background and methods used for the solution and interpretation of the results. Students must also prepare for inclass presentations based on their homework or projects which will be worth 20%. There will be one final exam worth 30% that will be based on the various mathematical techniques presented in the class during the semester.

Academic Integrity: All students will be expected to abide by the Honor Code: *Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.*

Disability Accomodation: Any student who, because of a disability, may require some special arrangements in order to meet course requirements should contact the instructor as soon as possible to make such accomodations as may be necessary.

Good Luck and please feel free to contact me if you have any questions.