Instructor Information:

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Course Information:

Lectures: MWF, 12:00-12:50PM, EN 1044
Office Hours: M 11-11:50AM, F 10:00-10:50AM and by appointment.

Prerequisites: Grade of C or better in MATH3340.

Course Description: This course is one of the core courses for the Interdisciplinary Computational Science Minor which naturally follows Math3340. It further develops the skills needed for computational problem solving and numerical analysis. Topics addressed include: one-step and linear multistep methods for initial value problems; truncation errors, stability analysis, and convergence of numerical methods; finite difference approximation for elliptic equations and initial boundary value problems; iterative methods for sparse linear systems. Students typically complete a final project in this course.

Objectives/Outcomes/Standards: Math4340 is an undergraduate course for applied numerical analysis. The objective of this course is to endow the student with the fundamental numerical tools to solve practical problems arising from engineering or physical sciences. This course will provide engineering or science majors with a basic knowledge of numerical methods including: iterative algorithms for solving systems of linear equations, and numerical solution to ordinary and partial differential equations. MATLAB is the software environment used for implementation and application of these numerical methods. The numerical techniques learned in this course enable students to work with mathematical models of technology and systems. This course is intended to be a mathematical introduction to the theory and practical use of basic numerical methods. While the emphasis of the course is placed solidly on applications, we will discuss some of the mathematical theory behind the methods we study. Some theoretical understanding is critical to the proper practice of numerical analysis, because novel numerical methods are developed based on a solid grab of mathematical theories.

Disability Statement: If you have a physical, learning, sensory or psychological disability and require accommodations, please let me know as soon as possible. You will need to register with, and provide documentation of your disability to University Disability Support Services (UDSS) in SEO, room 330 Knight Hall.

Course Requirements/Assignments: You are expected to work on your homework alone. If there are any questions, I'll be happy to address them during my office hours or, if major clarification is necessary, in class.

Grading Standards:

Homework/Computational Projects: 65%. Several homework problems/computational projects will be assigned during the semester - expect there will be at least six and at most eight of these projects altogether. They will be designed such that students have an opportunity to engage the skills acquired on various topics. The focus in all these projects will not be only on doing them anyway; rather, it will be on finding a computationally efficient alternative. This may mean coming up with good data structures and storage, a good algorithmic strategy or nice algorithm design etc. depending on the problem. These projects should not take too long if the material in class is properly understood, although it is a good rule to think that you should be able to devote about the same amount of time for individual work as the time you spend in class. All homework due within one week from the date it was assigned.

Final project: 35%. The final project will count separately. The work needs to be completed by the end of the exam week.

Your letter grade is determined as follows: A=not below 90; B=not below 80, C=not below 70, D=not below 60, F=below 60.

Attendance/Participation Policy: Class attendance and participation are strongly recommended. University sponsored absences are cleared through the Office of Student Life.

Academic Honesty: The University of Wyoming is built upon a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated [from the University Catalog]. Teachers and students should report suspected violations of standards of academic honesty to the instructor, department head, or dean. Other University regulations can be found at: [http://www.uwyo.edu/generalcounsel/new-regulatory-structure/index.html](http://www.uwyo.edu/generalcounsel/new-regulatory-structure/index.html)

The instructor may make changes to the syllabus as the course proceeds. If necessary, these changes will be announced in class. Substantive changes made to the syllabus shall be communicated in writing to the students.