SYLLABUS FALL 2018
The University of Iowa
The College of Liberal Arts and Sciences
Department of Mathematics
Elementary Numerical Analysis
MATH:3800:0005, Cross listing: CS:3700:0005

Building: Shaeffer Hall
Room Number: 14
Class Time: 2:30p-3:20p, MWF
Website address: http://homepage.math.uiowa.edu/~strohmer/

Some of the policies relating to this course (such as the drop deadline) are governed by its administrative home, the College of Liberal Arts and Sciences, 120 Schaeffer Hall.

Instructor: Gerhard Strohmer
Office location: McLean Hall 225 D
Office hours: 10:30-11:20 MWF, and by appointment
Phone: 335-0721
E-mail: gerhard-strohmer@uiowa.edu

DEO Contact Information
Maggy Tomova, 14 MLH, maggy-tomova@uiowa.edu

Prerequisites
(MATH:2550 or MATH:2700) and (MATH:1560 or MATH:1860)

Description of Course

This course examines numerical methods for finding solutions of nonlinear equations, polynomial interpolation and approximation of functions, numerical integration, solution of simultaneous linear algebraic equations, and solution of ordinary differential equations. Numerical analysis is significant almost wherever mathematics is applied, as one can only very rarely find explicit solutions of mathematical problems; for example most integrals cannot be solved in a closed form. Many homework assignments require use of a computer. An introduction and support will be provided for the use of language Python and the numeric extension Numpy. For this no previous knowledge of Python is required, but this course does not replace a full-fledged programming course. We are using version 2.7 of python.
Objectives and Goals of the Course

We aim to give an overview of methods used in finding approximate solutions of some important mathematical problems, to understand the mathematics behind these procedures and their error analyses. We will also learn how to implement them in Python and use some of the procedures that are included in Python. We will cover Chapters 1-6 and 8 in the book.

The book is available at the University Book Store or Iowa Book and Supply.

Optional texts:-
Texts on reserve:-
Other available materials: Lecture notes will be made available on ICON as the semester progresses.

Grading System and the Use of +/-
There will be two midterms, both during class time, one final and weekly homework assignments. The homework assignments need to be submitted electronically on ICON. For the midterms you can bring one sheet of less than legal size of notes written in your own hand, for the final two sheets. The use of telecommunication devices is strictly forbidden during tests. A calculator with up to 256 K storage capacity is permitted.

Grades: The grade stored on ICON for each homework set will be a number between 0 and 100, 100 being perfect. For the homework all problems are of equal weight, while for the tests the average may be weighted, with more emphasis being given to some problems than others. The emphasis will be noted on the test.

The final grade will be based on a weighted average of the test scores and the homework. Both of the midterms contribute 20% to the total score, the final 30%. Homework accounts for the remaining 30%. While the first midterm only covers the subject matter covered up to that time, the second one will be about the material covered since the last midterm, and the final will be comprehensive.

The following table gives the minimum percentages for the grades except A+:

<table>
<thead>
<tr>
<th>50</th>
<th>53</th>
<th>57</th>
<th>60</th>
<th>63</th>
<th>70</th>
<th>75</th>
<th>80</th>
<th>86</th>
<th>92</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>D+</td>
<td>C-</td>
<td>C</td>
<td>C+</td>
<td>B-</td>
<td>B</td>
<td>B+</td>
<td>A-</td>
<td>A</td>
</tr>
</tbody>
</table>

Your homework and test grades will be stored on ICON.
Please note that the grade of A+ is very rarely given in this course and only in extraordinary situations.
A Word about the Date and Time of the Final Exam

The date and time of every final examination is announced by the Registrar generally by the tenth day of classes. **No exams of any kind are allowed during the last week of classes.** All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar’s web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of the final exam.

**Course Policies**

Course attendance and participation in class discussions is strongly recommended, but will not be checked. Homework will be accepted until the time stated on ICON. There are no exceptions except if you are transferring into the class or have a very good reason. (This includes illnesses with medical documentation and family emergencies) In that case the submission is by e-mail.

**Student Collaboration**

The homework for this course is designed to help you master your knowledge related to the topics covered during lecture. As such, you may work on the homework problems with others or use online resources. However, please be aware that to master the skills needed for this class, practice is required and that to do well on the final exam you will need to work many of these problems multiple times without help. Be sure to test your knowledge by doing much of the homework on your own. Even if you have collaborated with others in solving the problems, you must write them up and submit them independently.

**Resources for Students**

Students will find the Writing Center and the Speaking Center very useful for this course:

Writing Center: [http://www.uiowa.edu/~writingc/](http://www.uiowa.edu/~writingc/)

Speaking Center: [http://clas.uiowa.edu/rhetoric/for-students/speaking-center](http://clas.uiowa.edu/rhetoric/for-students/speaking-center)

Math Tutorial

**Calendar of Exams**

The first midterm will be on Wed., 9/26, the second one on Wed., 10/31.
Administrative Home
The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and other policies. These policies vary by college (https://clas.uiowa.edu/students/handbook).

Electronic Communication
Students are responsible for official correspondences sent to their UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2).

Accommodations for Disabilities
UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as mental health, attention, learning, vision, and physical or health-related condition) by registering with Student Disability Services (SDS). The student should then discuss accommodations with the course instructor (https://sds.studentlife.uiowa.edu/).

Nondiscrimination in the Classroom
UI is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University’s Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity at diversity@uiowa.edu or diversity.uiowa.edu.

Academic Integrity
All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty. Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through the UI email address.

CLAS Final Examination Policies
The final exam schedule for each semester is announced around the fifth week of classes; students are responsible for knowing the date, time, and place of a final exam. Students should not make travel plans until knowing this final exam information. No exams
of any kind are allowed the week before finals. (https://clas.uiowa.edu/faculty/teaching-policies-resources-examination-policies.)

**Making a Complaint**
Students with a complaint should first visit with the instructor or course supervisor and then with the departmental executive officer (DEO), also known as the Chair. Students may then bring the concern to CLAS (https://clas.uiowa.edu/students/handbook/student-rights-responsibilities).

**Understanding Sexual Harassment**
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, definitions, and the full University policy, see https://osmrc.uiowa.edu/.