SYLLABUS FALL 2016

The University of Iowa
The College of Liberal Arts and Sciences

Department of Mathematics

Fundamental Properties of Spaces and Functions
MATH:3770:0AAA

Prerequisite: Second-semester calculus

Corequisite: MATH:2700

Building: McLean Hall
Room Number: 210 MLH
Class Time: 9:30am - 10:20am, MWF
Website address: 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:
Dan Anderson, 14 MLH, dan-anderson@uiowa.edu

Description of Course:

The course covers Chapter 1, Sections 1-4 in Chapter 2, Sections 1-5 in Chapter 3, Chapter 4, Sections 1-5 in Chapter 5 and all sections in the remaining chapters. In Chapter 1 we will have a short introduction to logic, Chapter 2 provides an introduction to set theory that is not quite rigorous. The range of subjects covered in Chapters 3 to 9 is very similar to that of Calculus I, and some of Calculus II. In contrast to an ordinary
calculus class we will devote most of our efforts to precise logical proofs of theorems. The homework also consists to quite an extent of writing proofs.

**Approximate Schedule**

(Subject to Change)

<table>
<thead>
<tr>
<th>Week</th>
<th>Sections</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1,1.2,1.3</td>
<td>Logic</td>
</tr>
<tr>
<td>2</td>
<td>1.4,2.1</td>
<td>Logic, Set Theory</td>
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<tr>
<td>3</td>
<td>2.2,2.3</td>
<td>Set Theory</td>
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<tr>
<td>4</td>
<td>2.4,3.1,3.2</td>
<td>Set Theory, Real Numbers</td>
</tr>
<tr>
<td>5</td>
<td>3.3,3.4,3.5</td>
<td>Real Numbers</td>
</tr>
<tr>
<td>6</td>
<td>4.1,4.2</td>
<td>Sequences</td>
</tr>
<tr>
<td>7</td>
<td>4.3,4.4</td>
<td>Sequences</td>
</tr>
<tr>
<td>8</td>
<td>5.1,5.2,5.3</td>
<td>Limits and Continuity</td>
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<tr>
<td>9</td>
<td>5.3,5.4</td>
<td>Limits and Continuity</td>
</tr>
<tr>
<td>10</td>
<td>6.1,6.2,6.3</td>
<td>Differentiation</td>
</tr>
<tr>
<td>11</td>
<td>6.4,7.1,7.2</td>
<td>Differentiation and Integration</td>
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<tr>
<td>12</td>
<td>7.3,8.1</td>
<td>Integration and Series</td>
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<tr>
<td>13</td>
<td>8.2,8.3</td>
<td>Series</td>
</tr>
<tr>
<td>15</td>
<td>9.1,9.2</td>
<td>Sequences of Functions</td>
</tr>
<tr>
<td>16</td>
<td>9.3 and Review</td>
<td>Sequences of Functions</td>
</tr>
</tbody>
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**Objectives and Goals of the Course:**

The course presents the subject matter of calculus in a logically coherent way. In doing so it aims to give you a deeper understanding of calculus and to prepare you to read and write proofs in calculus and other areas of mathematics.

Quite a few students find the transition from calculus to this class a rather big step. Please see me if you have any difficulties.
Textbook:

Other Course Materials:
Occasional handouts

Other Course Resources:
Practice session with teaching assistant

Grading System and the Use of +/-:

There will be two midterms, both during class time, one final and weekly homework assignments. For the midterms you can bring one letter-size sheet 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 for each separate problem will be a number between 0 and 100, 100 being perfect. For the homework a straight average of the grades for all problems is taken, 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 homework sets, quizzes and exams. The homework average contributes 20%, the midterms contribute 20% each and the final 40%. While the first midterm only deals with 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>67</th>
<th>75</th>
<th>80</th>
<th>87</th>
<th>92</th>
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<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 for full credit until 4:45pm on the day it was due. On the second day only 75% of the credit are given, then 50% on the third day, 25% on the fourth, after that no credit at all. 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)

**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 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)

**Calendar of Exams:**
The first midterm will be on Wednesday, September 28, the second one on Wednesday, November 2.

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**Teaching Policies & Resources — Syllabus Insert**
Administrative Home
The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at [http://clas.uiowa.edu/students/handbook](http://clas.uiowa.edu/students/handbook).

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences ([Operations Manual, III.15.2, k.11](#)).

Accommodations for Disabilities

The University of Iowa is committed to providing an educational experience that is accessible to all students. A student may request academic accommodations for a disability (which includes but is not limited to mental health, attention, learning, vision, and physical or health-related conditions). A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor’s office to make particular arrangements. Reasonable accommodations are established through an interactive process between the student, instructor, and SDS. See [http://sds.studentlife.uiowa.edu/](http://sds.studentlife.uiowa.edu/) for information.

Academic Honesty

All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College’s [Code of Academic Honesty](#): "I pledge to do my own academic work and to excel to the best of my abilities, upholding the [IOWA Challenge](#). I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled ([CLAS Academic Policies Handbook](#)).

CLAS Final Examination Policies
The final examination schedule for each class is announced by the Registrar generally by the fifth week of classes. Final exams are offered only during the official final examination period. **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 a final exam.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

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 have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Office of the Sexual Misconduct Response Coordinator for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.