Math 421: The Theory of Single Variable Calculus

Credits: 3 credits

Canvas Course URL: https://canvas.wisc.edu/courses/202086

Meeting Time and Location: Online

Instructional Mode: Math 421-summer 2020 will be delivered remotely. This course is asynchronous. The pre-recorded lecture videos will be posted on Canvas before 10 am each lecture days: M, T, W, TH.

INSTRUCTORS AND TEACHING ASSISTANTS

Liang Kong, Associate Professor

Instructor Availability: MW 5:00-6:00 PM (email me to make an appointment)

Instructor Email/Preferred Contact: kong45@wisc.edu

Teaching Assistant: Nemetz, Sean

TA Office Hours: Please contact your TA for the office hours

TA Email/Preferred Contact: snemetz@wisc.edu

OFFICIAL COURSE DESCRIPTION

Course Description
This course covers material in first (and second) semester calculus but it is intended to teach math majors to write and understand proofs in mathematics in general and in calculus in particular. The course is designated as writing intensive course.

Requisites
MATH 234

LEARNING OUTCOMES

Upon completion of this course the student is expected to:

- be able to write and understand rigorous proofs in mathematics in general
• know and understand the basic definitions and theorems of differential and integral calculus in a single real variable
• be able to tackle problems in single-variable calculus

GUIDELINES FOR SUCCESS

Time Commitment
As you begin this course, you would be wise to schedule 8 or more hours per week for studying materials and completing assignments. Falling behind in this course is particularly problematic because the concepts we cover are cumulative. This means that not becoming proficient with information and objectives presented and assessed in a particular week can lead to low scores for that week as well as in subsequent weeks.

TEXTBOOK & OTHER COURSE MATERIALS
• Book of Proof, 3rd edition, by Richard Hammack (open source. Click here to download)

OUTLINE OF TOPICS:
• Quick review on functions and graphs.
• Limits
• Continuous functions
• “Three hard theorems”
• Derivatives
• Differentiation
• Inverse functions
• Integrals
• The fundamental theorem of calculus
• Approximation by polynomials, if time permits
• Additional topics, if time permits

HOMEWORK & OTHER ASSIGNMENTS
• Homework will be assigned daily, and it will be posted at Canvas
• Homework will be collected and graded. Exams will be partially based on these assignments, so completing the assignments is essential for learning the class material.

EXAMS
There will be two midterm exams and a FINAL. The final exam will be cumulative and comprehensive. If I am contacted with an acceptable/documentated excuse (before the date of the exam) then you may take a makeup exam.
• Exam 1 (06/25)
• Exam 2 (07/16)
ASSIGNMENTS AND WEIGHTS
Your overall course grade will be based on homework and 3 exams listed above, as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
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<tr>
<td>Two in-class Exams (20% each)</td>
<td>40%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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LETTER GRADE
Your total scores will be rounded up (by up to .99%), and fit on the following curve:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90%</td>
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<tr>
<td>AB</td>
<td>86%</td>
</tr>
<tr>
<td>B</td>
<td>80%</td>
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<tr>
<td>BC</td>
<td>76%</td>
</tr>
<tr>
<td>C</td>
<td>70%</td>
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<tr>
<td>D</td>
<td>60%</td>
</tr>
<tr>
<td>F</td>
<td>less than 60%</td>
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RULES, RIGHTS & RESPONSIBILITIES
- See the Guide’s to Rules, Rights and Responsibilities

ACADEMIC INTEGRITY
By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison’s community of scholars in which everyone’s academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to studentconduct.wiscweb.wisc.edu/academic-integrity/.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES
The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional
accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA. 
http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php

DIVERSITY & INCLUSION
Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world. https://diversity.wisc.edu/

Subject to Change Statement
This syllabus is subject to change at the discretion of the instructor to accommodate instructional and/or student needs. If a major change is made, students will be notified well in advance