MATH 271 (3 units)

REAL VARIABLES

Mo We 5:30 pm - 6:45 pm in S 139
California State University, Fresno
Fall 2013

Instructor : Dr. Stefaan Delcroix
Office : Peters Business 354
Phone : (559) 278-2555
E-mail : sdelcroix@csufresno.edu
Web Page : http://zimmer.csufresno.edu/~sdelcroix
Office Hours : M 8:30am-10:30am, W 9am-noon

Prerequisites : MATH 172
Textbook : Lecture notes, available on my web site.
Course Description : Theory of sets; cardinals; ordinals; measure theory; modern theory of integration and differentiation.

Course Goals : This is a graduate course in analysis, so you should expect a lot of rigorous proofs. The following concepts will be covered:

- review of set theory
- algebras and σ-algebras
- outer measure and Lebesgue measure
- measurable sets
- measurable functions
- Lebesgue integral
- characterization of Riemann-integrable functions

Primary Learning Outcomes : In addition to the obvious goal of mastering the concepts listed in the course description, it is also intended that each student will:

- write rigid formal mathematical proofs
- gain a deep understanding of Lebesgue measure and integration theory
• appreciate the utility of abstraction and formal thinking

• gain clear insight into the need of abstract integration theory (versus Riemann integration)

**Grading Policy**: I will use the following grading scheme:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Exam I and II</td>
<td>20% each</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

- A: 85% - 100%
- B: 70% - 84%
- C: 60% - 69%
- D: 50% - 59%
- F: 0% - 49%

**Web Page**: My web page is

http://zimmer.csufresno.edu/~sdelcroix

It will contain important information about this course: lecture notes, homework assignments, solutions to homeworks and exams, etc.

**Homework**: I will assign homework almost every Wednesday. You will have one week to hand in the homework in class. No late homework will be accepted.

**Exams and Final**: There will be two in-class exams and one take-home final. Each exam will consist of two parts and cover a specific unit of material while the final is comprehensive. No notes or textbooks are allowed for the first part of the in-class exams. See the schedule for the tentative dates. You will hold a verbal defense of your written answers to the take-home final. The grade on your final is based on your written answers and any clarifications you make during your verbal defense.

No make-up exams are given unless you have an extremely good reason for not taking the exam at the scheduled time. If possible, notify me ahead of time if you will not be able to take the exam at the scheduled time.

**Attendance**: Attendance is required! If you are absent from class, it is your responsibility to check on announcements made while you were absent.

**Students with Disabilities**: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Service to Students with Disabilities in the Henry Madden Library Suite 1202 (278-2811).
For required syllabus statements about Students with Disabilities, the Honor Code, Cheating and Plagiarism, Computers, Disruptive Classroom Behavior, and Copyright Policy: see

http://www.fresnostate.edu/academics/policies-forms/instruction/syllabus.html

**SUBJECT TO CHANGE**

This syllabus and schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.

**IMPORTANT DATES**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Monday 9/2</td>
<td>Labor Day - no classes</td>
</tr>
<tr>
<td>Thursday 9/5</td>
<td>Last day to add classes without instructor permission</td>
</tr>
<tr>
<td>Thursday 9/19</td>
<td>Last day to add classes with permission</td>
</tr>
<tr>
<td></td>
<td>Last day to drop classes without a serious and compelling reason</td>
</tr>
<tr>
<td>Monday 9/30</td>
<td>Exam I</td>
</tr>
<tr>
<td>Monday 11/4</td>
<td>Exam II</td>
</tr>
<tr>
<td>Monday 11/11</td>
<td>Veteran’s Day - no classes</td>
</tr>
<tr>
<td>Tuesday 11/19</td>
<td>Last day to withdraw from a class for a serious and compelling reason</td>
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<tr>
<td>Wednesday 11/27 till Friday 11/29</td>
<td>Thanksgiving Recess - no classes</td>
</tr>
<tr>
<td>Wednesday 12/12</td>
<td>Last day of instruction</td>
</tr>
<tr>
<td>Monday 12/16 till Thursday 12/19</td>
<td>Final semester examinations</td>
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</tbody>
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**TAKE-HOME FINAL + VERBAL DEFENSE:**
**DUE IN PB 354 BY 3PM ON FRIDAY DECEMBER 20**