

MAT 5990 SPECIAL TOPICS (INTRODUCTION TO MEASURE THEORY)

Summer Semester 2019

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| Instructor: Dr. Jimmy Risk | Time: TuTh 3:30pm – 4:45pm |
| Email: jrisk@cpp.edu | Place: Building 3–1616 |

Office Hours:

- Monday 12:00pm-1:40pm
- I am typically available before and after class on Tuesday and Thursday as well
- (or by appointment)

My Office Location: Building 94 Room 238

Book:

- **Required:** A Radical Approach to Lebesgue's Theory of Integration by David Bressoud
- **Reference (Optional):** Probability and Stochastics by Erhan Cinlar
- **Reference (Optional):** Functional Analysis for Probability and Stochastic Processes by Adam Bobrowski

Course Description: Lebesgue measure and integration, Borel sets, monotone functions, measure spaces and measurable functions, the Radon-Nikodym theorem, the Fubini theorems, applications, specifically to probability theory.

Prerequisites: Some real analysis background. Familiarity with \inf , \sup , \limsup , \liminf , concepts of continuity, uniform continuity, differentiability, integration (at the real analysis level).

Grading Policy:

1. Attendance and participation (10%)
2. Homework (40%)
3. Midterm (20%)
4. Final (30%)

Class Policy:

- Lecture will mostly be board writing, following the books loosely and providing supplementary material.
- Regular attendance is essential and expected.

Homework Policy:

- Homework is due weekly, with exceptions due to holidays and midterms.
- No homework makeups will be accepted. However, the lowest two homework scores will be dropped. (Exceptions include extreme emergencies, with a doctors note or similar required).
- For the homework grading, I am going to use the following scale from 0–5:
 - 5: The problem is done correctly, and is written well. There may be a minor mistake or two (depends on the difficulty of the problem).
 - 4: Most of the problem is done correctly, but there are too many minor errors, or the explanation/presentation is poor enough to warrant taking a point off.
 - 3: The problem is mostly right, with a major error or two or several minor errors.
 - 2: The problem is mostly wrong, or started correctly but got off track.
 - 1: The problem is almost all wrong. There may be a couple of relevant parts completed but it is not complete.
 - 0: The problem is almost all wrong, and/or incomplete.

Exam Policy:

- There will be one take-home midterm, made accessible Friday June 28, and due Tuesday July 2 during class.
- The (take-home) final will be made accessible Friday August 2, and due Tuesday August 6 by 8pm (hand in to my office).
- **Both the midterm and final will be take-home.**
- No makeups for the midterm/final are allowed except under extreme circumstances. (Doctor's note or similar required)
- You may use any **class** resource (book, notes, homework, etc.) **No online resources are allowed.** If you use another textbook, you **NEED** to quote the book and page number. You may not work together. This policy will be **strictly** enforced.
- The final exam is **cumulative**, with emphasis on later material.
- Details on types of problems will be discussed as the midterm approaches.

Academic Honesty:

- All forms of academic dishonesty at Cal Poly Pomona are a violation of university policy and will be considered a serious offense.
- Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation.
- This policy will be strictly enforced, especially during quizzes and tests. I will not hesitate to move students if any behavior warrants it.
- All handed in work should be **your own**. If you utilize assistance from friends or the internet, **make sure you UNDERSTAND the material and that it is written in your own words**. Online resources are extremely useful, but copying solutions without understanding them will only hurt your performance. It is also easy to fall into a trap of thinking you understand a solution while copying it down, but not *really* understanding it fully. Any work copied will result in a warning (one per student), followed by 0's on the question for each repeat offense (even if a single part is copied).

Important Dates:

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|--------------------|---|
| May 30 (Thursday) | Classes Begin |
| June 25 (Monday) | First Day To Withdraw By Petition For Serious and Compelling Reasons |
| July 2 (Tuesday) | Midterm |
| July 4 (Tuesday) | 4th of July (No Class) |
| July 17 (Monday) | Last Day to Withdraw By Petition For Serious and Compelling Reasons and Receive a "W" |
| August 6 (Tuesday) | Final Exam (6pm–8pm) |

Class Calendar (subject to change):

| Week | Dates | Book Sections |
|---------|---------------|---|
| Week 1 | 5/30 | 1.1, 1.2 |
| Week 2 | 6/4, 6/6 | 2.1, 2.2, 2.3 |
| Week 3 | 6/11, 6/13 | 3.1, 3.2, 3.3 |
| Week 4 | 6/18, 6/20 | 4.1, 4.2, 4.3, 4.4 |
| Week 5 | 6/25, 6/27 | 5.1, 5.2, 5.3, 5.4 |
| Week 6 | 7/2, 7/4 | (Buffer day to finish old material) |
| Week 7 | 7/9, 7/11 | 6.1, 6.2, 6.3, 6.4 |
| Week 8 | 7/16, 7/18 | Connections to probability theory |
| Week 9 | 7/23, 7/25 | 7.1, 7.2, 7.3, 7.4 |
| Week 10 | 7/30, 8/1 | More connections to probability theory, time to finish material |
| Week 11 | 8/6 (Tuesday) | Final Due (8:00pm) |

Grade Cutoffs:

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|----|----|----|----|
| A | 93 | C | 75 |
| A- | 90 | C- | 72 |
| B+ | 87 | D+ | 69 |
| B | 84 | D | 66 |
| B- | 81 | D- | 63 |
| C+ | 78 | F | 0 |