**Math 436 — Mathematical Statistics**

**Syllabus and Course Procedures** **Spring 2012**


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**Office Hrs**

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|---|---|
| Mon | 9:10-10:00 |
| Tue | 9:10-11:00 |
| Wed | 12:10-1:00 |
| Fri | 9:10-10:00 |

**Required Texts** John A. Rice, Mathematical Statistics and Data Analysis, 3rd ed., Duxbury 2007.

**Rough Course Outline** The following is an optimistic course summary—optimistic in the sense that we will most likely run out of semester before all sections below are covered.

Review Selections:
- Transformations of the 1D Probability Density
  - Section 2.3 (Rice), Section 5.7 (Ross)
- 2D Probability Densities, Independence, Marginals, and Conditional Densities
  - Section 3.3, 3.4, 3.5 (Rice), Sections 6.1, 6.2, 6.5 (Ross)

Section 3.6, 3.7, 3.8 (problems)
Section 4.3, 4.4, 4.5, 4.6, 4.7 (problems)
Section 5.2, 5.3, 5.4 (problems)
Section 6.2, 6.3, 6.4 (problems)
Section 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10 (problems)
Section 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.8, 9.9, 9.10, 9.11 (problems)
Selects from Ch 10, 10.4, 10.9 (problems)
Selects from Ch 11, 12, 13 as time permits

**Grades** Your course grade will be determined using a weighted average as follows:

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|---|---|---|
| Homework | 26 % | |
| Math-Stat Competition | 12 % | |
| Class Participation — Problem Presentations | 6 % | |
| Exam 1 | | |
| In-Class | 7 % | Monday, February 27 |
| Take-Home | 10 % | (a 48-hour period during the week of Feb 27 - Mar 2) |
| Exam 2 | | |
| In-Class | 7 % | Monday, April 16 |
| Take-Home | 10 % | (a 48-hour period during the week of Apr 16 - Apr 20) |
| Final Exam — In-Class | 22 % | Thursday, May 9, 6:30-9:30 am |

**Homework Assignments** Working problems on your own is where most of the learning occurs! Homework assignments will usually be assigned and collected once or twice a week. It will be the norm for an assignment to be comprised of many problems, requiring much time, thought, and effort. Notice that when grades are determined, homework is weighted more than any other component of the course; therefore, be prepared to devote a significant amount of time working on the homework sets. Never procrastinate in starting an assignment! You are encouraged to discuss problem concepts and solution techniques with your fellow students, but your final homework reports must be your own work. Homework solutions should be legible and presented in a logical fashion. Although this is a mathematics course, don't hesitate to accompany your mathematical derivations with explanations and ideas written in complete English sentences.

**Math-Stat Competition** It is important that you gain experience in applying course principles and techniques to real-world settings. You will be given a problem that is well-defined, but open-ended in the sense that the problem might be solved, or at least approximately solved, using many different approaches and methods. The setting of the problem will be an actual application of probability and mathematical statistics, much like an applied statistician or mathematician would be exposed to in their first job. The project will require modeling, analysis, conclusions, and a formal report. Seventy percent of your grade on this project will be on mathematical content and thirty percent will be an assessment of your presentation. **You will work on this project in competitive teams of two students, NOT three students.** This project will be competitive in the sense that an award will be given to the best overall project. More detailed requirements of the project will be provided at the time the project assignment is distributed — about mid-semester.

**Class Participation — Problem Presentations** It is important that all students be engaged in class discussions, group work and activities, and gain practice in the communication of mathematical ideas both orally and written. This component of your grade reflects your efforts and progress in these areas. To assess this course grade component, I intend to use attendance, group contributions, in-class presentations, and scores on in-class problems which I may occasionally collect.

**Midterm Exams** There will be two midterm examinations, and each of these exams will consist of in-class and take-home portions. The in-class portions will focus on conceptual understanding, while the take-home portions will stress problem-solving, applications, and extensions. The take-home exams will be particularly challenging, but it is my goal that the examination problems serve as unifying examples of the course topics as well as extensions of key course concepts. Take-home exam problems are strictly independent endeavors; absolutely no collaboration between students on take-home exams!

**Final Exam** The final exam will be cumulative and will last three hours. It will consist of a mixed bag of short conceptual questions, medium level exercises, and a few challenging applications and extensions. Since your written report for the math-stat competition will require much of your outside of class time, there will be no take-home component of the final exam.

**Late Policy** All assignments must be turned in at the beginning of the class period on the assigned due date, unless specified otherwise by the instructor. No credit will be given to unexcused late papers. If you have a conflict due to illness or sports, e-mail me right away.

**Academic Honesty** Any work you submit for credit in this course must result directly from your own understanding, thoughts, and ideas. Presenting the work of others as your own in strictly prohibited.

**Disabilities** If you have any disability and therefore may have need for some type of accommodation in order to participate fully in this class, please feel free to discuss your concerns in private with Erin Salva, Coordinator of Disability Services (phone 5145).