

MATH 5710

INTRODUCTION to PROBABILITY

Spring 2010

T 7:15 – 9:45 pm (ENGR 401)

First classes: Tuesday, January 12

Course Objective:

This course is an introduction to probability theory for students with a calculus background. The course focuses on developing a student's *intuitive and mathematical grasp of probability theory and methods*. Overall, understanding of the fundamental concepts is stressed over formal mathematical manipulations, but *mathematical rigor is expected*. A variety of examples and applications are presented in class or developed through homework exercises. Topics include probability rules, discrete and continuous random variables (r.v.'s), normal approximation, expectation, conditional probability, joint and marginal distributions, the central limit theorem, moment generating functions, and applications.

Office Hours:

T 5:30 – 6:45 pm (except Feb 2), phone 435-797-2815, or e-mail me at Dan.Coster@usu.edu. We will also have excellent TAs helping you on the course material via e-mail and online chat, etc.

Texts:

Mathematical Statistics and Data Analysis, 3rd Ed., by John A. Rice, Duxbury Press, (2007, ISBN 0-534-39942-8).

This course covers the material of Chapters 1-5, with occasional examples and illustrations taken from the later chapters. Some specialized topics of Chapters 3 and 4 may be omitted.

Prerequisites:

It is a plus if you have had Math 2210 (Multivariable Calculus) but you should be OK with Math 1210 (Calculus I) and parts of Math 1220 (Calculus II). We will go over specific calculus tools from Math 1220 and 2210 as and when we need them. The most essential calculus tool you will need is integration by parts, so learn or refresh on that topic as soon as you can.

Homework:

Homework assignments will be given every class meeting (including the last class meeting on April 27). Questions are from the textbook. It is critical to work every problem and develop a comprehensive written solution for each one as the midterm and final will require similar efforts and attention to detail. You must show work for full credit and explain your methodology or logic when necessary. Algebra and integrations

or differentiations performed on a symbolic calculator or with software such as Maple are **NOT** sufficient – you must show enough of the steps, handwritten or typeset, of a derivation to show you have mastered the underlying mathematical mechanics used to reach a numerical or algebraic solution as well as the solution itself. Pictures that help to explain your reasoning are strongly encouraged. You may work together in study groups to solve homework problems, but your write-up must be clearly your own, independent effort.

Completed assignments should be scanned to PDFs (or be Word files if they are prepared in that format) and uploaded to Blackboard. Late assignments will incur a penalty of 10% of your score per day late, up to 5 days, after which no credit is given for a missed assignment. Each assignment is due by 11:59 pm of the **next** class meeting day, so that we can address difficulties with particular problems at the next class meeting.

Exams:

There will be one midterm, and a final, each a take-home. Exams are open book and open notes. Unlike the homework assignments, you must work by yourself on the tests. Please use only me and the TAs for human assistance on the tests. The tests will be distributed via e-mail and via download from Blackboard shortly after the class finishes.

Midterm: Tuesday, March 2, due by 11:59 pm Thursday, March 4 via upload to Blackboard;

Final: Tuesday, April 27, due 11:59 pm Tuesday May 4.

The midterm will be based on material covered through the Feb 23 meeting and its assignment; the final is comprehensive but will focus on material from the midterm onwards.

Assessment:

Your final grade will be based on the following breakdown:

Homework:	50%
Midterm:	20%
Final:	30%

Disabilities:

If a student has a disability that will require some accommodation by the instructor, the student must contact the instructor and document the disability with the Disability Resource Center (DRC) as soon as possible. Any requests for special accommodations relating to attendance, pedagogy, taking exams, etc., must be discussed with and approved by the instructor. In cooperation with the DRC, course materials can be provided in alternative formats – large print, audio, diskette, or Braille.

Homework Exercises:

Here are the questions for homework for each class meeting. Do note that the last assignment is due at the same time as the final exam, by 11:59 pm on Tuesday, May 4, uploaded to Blackboard as a PDF or Word file, etc. This homework schedule may be modified slightly as we go along based on the pace at which we cover material and also to accommodate any technology failures (such as Blackboard malfunctioning).

1. Tuesday, Jan 12. Ch 1: 3, 6, 12, 16, 20.
2. Tuesday, Jan 19. Ch 1: 32, 41, 48, 50, 54.
3. Tuesday, Jan 26. Ch 1: 74, 76, Ch 2: 2(b)-(c), 4, 9.
4. Tuesday, Feb 2. Ch 2: 12, 14, 15, 17, 20, 22
5. Tuesday, Feb 9. Ch 2: 26, 32, 34, 40, 44, 52, 54
6. Tuesday, Feb 16. No class, Monday schedule
7. Tuesday, Feb 23. Ch 2: 56, 60, 64, Ch 3: 1, 7, 8.
8. Tuesday, Mar 2. Ch 3: 9, 12, 14, 17, 18 and Midterm
9. Tuesday, Mar 9. Ch 3: 19, 24, 27, 42(a).
10. Tuesday, Mar 16. Spring break week, no class.
11. Tuesday, Mar 23. Ch 4: 1, 2, 4, 5, 13
12. Tuesday, Mar 30. Ch 4: 14, 18, 25, 30, 31
13. Tuesday, Apr 6. Ch 4: 34, 43, 50, 55, 66
14. Tuesday, Apr 13. Ch 4: 75, 80, 81, 82, 91.
15. Tuesday, Apr 20. Ch 5: 3, 5, 10, 11, 13.
16. Tuesday, Apr 27. Ch 5: 16, 17, 18, 26.