

Probability

MA 320 Syllabus

1 Instructor

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Office Hours: MWF 10:00-11:00

2 Text

The text for the course is Introduction to Probability by Charles Grinstead and J. Laurie Snell. The book is available for free online at Introduction to Probability http://www.dartmouth.edu/~chance/teaching_aids/books_articles/probability_book/book.html.

3 Grading

Your grade for the course will be based on two exams during the semester, a final exam, and homework. Each of the four components will count toward 25% of your grade. I will post sample problems for the midterms and final exams. The homework will be done online.

- Numerical Grading Scale: A 90-100, B 80-89, C 70-79, D 60-69, E below 60,
- Relative Value to Components: Midterm 25%, Problem Sets 25%, Project 25%, Final 25%.
- A midterm and a final letter grade will be assigned.

4 Homework

The homework problems are online at WebWork <http://webwork2.ms.uky.edu/webwork2/>. Select the MA320 course and login with your student ID number.

5 Course Goals

The course is an introduction to probability. We shall cover the basic ideas of probability that are covered in Chapter 1 through Chapter 9 in the text. A student who earns a grade of A in the course should be able to pass the first Society of Actuaries examination. I have provided links to sample SOA exams, and these exams will give you a very good idea of the type of probability problem you should be able to work if you have a good understanding of the material.

6 Experiments and Software

A great deal of insight and understanding can be gained in probability by doing experiments. The experiment can be as simple as flipping a coin a number of times and keeping track of the outcomes. Generally, it will be much easier to perform such experiments by using computer software that does the coin flipping for you and records outcomes in as much detail as you like.

One particularly useful software package for probability experiments is R, and it is freely available for download on the CRAN website CRAN <http://cran.r-project.org/>. There are many introductory documents on using R. Here are a few.

- Simple R R/Verzani-SimpleR.pdf
- Introduction to R R/Introduction-to-R.pdf
- Reference Pad R/Rpad-refcard.pdf
- R for Beginners R/Paradis-rdebuts_en.pdf

Here is how one would flip a coin 100 times in R and count the number of Heads that you obtain.

```
coin <- c("H", "T")
flip <- sample(coin, 100, replace=TRUE)
length(which(flip == "H"))
```

Of course there are many other software packages that can be used to do experiments in probability. I suggest you find one you like and become proficient doing simple "coin flip" like simulations.

7 Tentative Course Schedule

- First Midterm shall be held during the 6th week of the course,
- Second Midterm shall be held during the 10th week of the course,
- Final shall be held during the time scheduled by the Registrar,
- Problem sets shall be assigned once per week and are due one week after they have been assigned.

8 Additional Course Policies

- Course policy of academic accommodations due to disability: If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.
- Course policy for attendance: Attendance will be recorded by calling on students to answer questions in class. If you are called upon but are not present your absence will be recorded. You are allowed four unexcused absences during the semester. For each unexcused absence in excess of four, two points will be deducted from your total course average that is used to determine your final letter grade. Excused absences will be given at instructor's discretion only with proof as defined by S.R. 5.2.4.2. For further information see <http://www.uky.edu/StudentAffairs/Code/part2.html>.
 - Make-up opportunities: The instructor shall give the student an opportunity to make up the work and/or the exam missed during an excused absence. . . " implies the student shall not be penalized for the excused absence.
 - Verification of Absences: Students missing work due to an excused absence bear the responsibility of informing the instructor about their excused absence within one week following the period of the excused absence (except where prior notification is required), and of making up the missed work.
- Course policy for submission of assignments: Students shall return all assignments on the due date. No late assignments shall be accepted without an excused absence.
- Course policy on academic integrity: All assignments, projects, and exercises completed by students for this class should be the product of the personal efforts of the individual(s) whose name(s) appear on the corresponding assignment. Misrepresenting others' work as one's own in the form of cheating or plagiarism is unethical and will lead to those penalties outlined in the University Senate Rules (6.3.1 & 6.3.2) at the following website: http://www.uky.edu/USC/New/rules_regulations/index.l The Ombud site also has information on plagiarism found at <http://www.uky.edu/Ombud>.
- Course policy on classroom civility and decorum: The university, college and department has a commitment to respect the dignity of all and to value differences among members of our academic community. There exists the role of discussion and debate in academic discovery and the right of all to respectfully disagree from time-to-time. Students clearly have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students

(S.R. 6 1.2). Equally, a faculty member has the right – and the responsibility – to ensure that all academic discourse occurs in a context characterized by respect and civility. Obviously, the accepted level of civility would not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin or other such irrelevant factors.

9 Additional Links

- Society of Actuaries <http://www.soa.org/>

10 Sample Exams

- SOA Sample Exam sample_exams/soa_sample_exam.pdf
- sample_1 sample_exams/sample_1.pdf