STAT 470, Introduction to Probability Theory --- Spring 2016

Class Meetings: MWF 10:00am - 10:50am, DuSable Hall 256

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Office hours: MWF 12:30pm - 1:30pm; or by appointment

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Email: ssaha1@niu.edu
Office hours: M 9:00am - 10:00am

Prerequisite: MATH 232, or a thorough knowledge of first-year college calculus---including differentiation, single and double integration, sums of infinite series, and related facts.

Required Textbook:

Course Description: The purpose of this course is to give you an introduction to probability theory and probability distributions. We will cover Chapters 2-5 in details from the textbook. Topics covered include: probability spaces, Bayes’ rule, random variables, probability distributions (discrete and continuous), mathematical expectations, moment generating functions, mixed distributions, joint and conditional distributions, and conditional expectations.

Note: The material presented will serve as a basis for the subsequent courses, e.g., STAT 472. In addition, this course is extremely important for those of you considering careers in actuarial science. Exam P (Probability) essentially consists of Chapters 2-7 from the textbook.

Learning Outcomes: By the end of the term successful students are expected to
- Understand the laws of probability, use counting rules, and understand independence
- Recognize and understand common discrete and continuous probability distributions and their properties
- Be able to use joint, marginal, and conditional densities and moment generating functions
- Understand moments, expectation, variance, covariance, correlation, and conditional expectation
- Derive theoretical results using algebra and calculus and apply these results to problems from a variety of applications

Homework (120 points): There will be 8 homework assignments during the semester; each worth 15 points. You must write your homework solutions NEATLY. You must present your solutions in the order that the problems are assigned. A 20% penalty will be imposed on all late assignments and these will only be accepted up to 3 days after the due date.

Attendance (30 points): You are expected to attend all classes and to arrive on time. If you miss a class, you are responsible for all material and announcement covered in class on that day. I will randomly record attendance for about 23 times, and 20 of them will be used to calculate your attendance score, each worth 1.5 points.
**Exams (350 points):** There will be two in-class midterm exams (100 points each) and a cumulative final exam (150 points). The dates for exams will be announced during classes. Please note that make up exams will NOT be given unless your absence is due to extreme circumstances, for which written documentation of excuse (doctor's note, funeral notice, etc.) is required. If you suspect you may miss an exam day, it is important to contact me well in advance of the test date.

**Grading:** The course grade will be based on homework (120 points), attendance (30 points), two midterm exams (200 points) and the final exam (150 points). The minimum points needed for each grade category are:

<table>
<thead>
<tr>
<th>Total points</th>
<th>450</th>
<th>425</th>
<th>400</th>
<th>375</th>
<th>350</th>
<th>325</th>
<th>300</th>
<th>250</th>
<th>&lt;250</th>
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</thead>
<tbody>
<tr>
<td>Course grade</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>D</td>
<td>F</td>
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*Note: The lowest midterm exam score may be replaced by the final exam score (if the final exam score in percentage is higher). For example, suppose one student gets 80 and 60 in the two midterm exams and gets 135 (i.e. 135/150=90 in percentage) on final exam. Then his/her lowest midterm score 60 will be replaced by the final exam percentage 90.*

**Some Suggestions:**

- Attend every class and be on time. Turn cell phones off.
- Read appropriate sections of the textbook before class.
- Spend a lot of time on homework problems and on working other problems from the textbook.
- Feel free to ask questions during class; your questions are an important part of this course. This course can be challenging, and very few students are able to master the material without keeping up on a regular basis. If you fall behind, then you will have to work much harder to catch up.
- Working together on homework problems is permitted and encouraged, but each student should write up his/her solutions independently of others. If homework is found to be copied, all students involved will receive a 0. Naturally, cheating on exams is an extremely serious offense and will be dealt with in the harshest possible way.
- Please feel free to talk to your TA or instructor. If you are falling behind or getting lost, then do not wait; act on it as soon as possible. Get help, spend more time studying, form study groups, go to your instructor’s and/or TA’s office hours.
- The syllabus may be changed in ways that may facilitate student learning. Changes will be announced in lecture.

**Accessibility:**
Northern Illinois University is committed to providing an accessible educational environment in collaboration with the Disability Resource Center (DRC). Any student requiring an academic accommodation due to a disability should let his or her faculty member know as soon as possible. Students who need academic accommodations based on the impact of a disability will be encouraged to contact the DRC if they have not done so already. The DRC is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1301 (V) or drc@niu.edu.

**Academic Integrity Statement:**
The Statement of Academic Integrity in the Undergraduate catalog will be strictly enforced with regard to homework assignments, quizzes, and exams. NIU’s updated policies on academic integrity, attendance and accommodations for students with disabilities can be found at:
http://www.niu.edu/stat/courses/pdfs/Accessibility_statement.pdf