ST 515-001 Course Syllabus

Experimental Statistics for Engineers I

FALL 2015

3 Credit Hours

Course Description

This course covers important concepts in probability and basic methods in statistical for graduate students in engineering. In probability, we will cover the concepts of sample space, probability, conditional probability, discrete and continuous random variables and distributions, expectation (including mean and variance), moment-generating function. In statistics, we will cover the concept of statistical inference, including sampling distribution, estimation methods, hypothesis testing, linear regression and analysis of variance. This course will provide the students basic knowledge of probability and statistics necessary for subsequent ST516 and other more advanced statistics courses.

Course Structure

This course is taught in a student-centered manner and will include periods of lecture and discussion.

Course Policies

Students are expected to check their unity email and the course website regularly for announcements and materials.

Instructors

Dr. Daowen Zhang (dzhang2) - Instructor

- Email: dzhang2@ncsu.edu
- Phone: 919-515-1933
- Office Location: 5122SAS Hall
- Office Hours: MW 2-4pm and by appointment

Shikai Luo - Teaching Assistant

- Email: sluo@ncsu.edu
- Office Location: 1101 SAS Hall
- Office Hours: Tu/Th 4:00 - 5:00 pm

Note: you are welcome to attend any office hours for the course.

Course Meetings
Course Materials

Textbooks
Probability & Statistics for Engineers & Scientists - Walpole, et.al.
Edition: 9th
Cost: About $180 new
This textbook is required.

Materials
- Basic Calculator – Cost May Vary
- Several free software packages, such as R, may be used during the semester – No cost

Requisites and Restrictions

Prerequisites
ST361 or graduate standing.

Co-requisites
MA 241

Restrictions
None.

Transportation
This course will not require students to provide their own transportation. Non-scheduled class time for field trips or out-of-class activities is NOT required for this class.

Safety & Risk Assumptions
None.

Grading

Grade Components

Homework — 100 points
• There will be **11 homework assignments**. These will be posted to the course website each Tuesday and will be due in class one week after they are assigned. The lowest homework grade will be dropped.

**2 Midterm Exams — 100 points each**

• All exams are closed book & note. For each midterm exam students may use one 8 ½ X 11 page of notes (front and back). Basic calculators (such as TI-83) may be used on all exams. Requests for re-grading of exams must be made in writing. These requests should contain a complete description of the reason for grade adjustment and the student’s name. The request should be attached to the exam and submitted to the instructor within two weeks of the day exams are returned in class.

**Comprehensive Final Exam — 200 points**

• All exams are closed book & note. For the final exam, students may use three 8 ½ X 11 pages of notes (front and back). Basic calculators (such as TI-83) may be used on all exams. Requests for re-grading of exams must be made in writing. These requests should contain a complete description of the reason for grade adjustment and the student’s name. The request should be attached to the exam and submitted to the instructor within two weeks of the day you receive exam scores.

**Total Possible — 500 points**

**Letter Grades**

This Course uses Standard NCSU Letter Grading. Percentage cutoffs are firm and no rounding occurs.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>97 ≤</td>
<td>A+ ≤ 100</td>
</tr>
<tr>
<td>93 ≤</td>
<td>A &lt; 97</td>
</tr>
<tr>
<td>90 ≤</td>
<td>A- &lt; 93</td>
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<tr>
<td>87 ≤</td>
<td>B+ &lt; 90</td>
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<tr>
<td>83 ≤</td>
<td>B &lt; 87</td>
</tr>
<tr>
<td>80 ≤</td>
<td>B- &lt; 83</td>
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<tr>
<td>77 ≤</td>
<td>C+ &lt; 80</td>
</tr>
<tr>
<td>73 ≤</td>
<td>C &lt; 77</td>
</tr>
<tr>
<td>70 ≤</td>
<td>C- &lt; 73</td>
</tr>
<tr>
<td>67 ≤</td>
<td>D+ &lt; 70</td>
</tr>
</tbody>
</table>
63 ≤ D < 67
60 ≤ D- < 63
0 ≤ F < 60

Requirements for Credit-Only (S/U) Grading

In order to receive a grade of S, students are required to take all exams and quizzes, complete all assignments, and earn a grade of C- or better. Conversion from letter grading to credit only (S/U) grading is subject to university deadlines. Refer to the Registration and Records calendar for deadlines related to grading. For more details refer to http://policies.ncsu.edu/regulation/reg-02-20-15.

Requirements for Auditors (AU)

Information about and requirements for auditing a course can be found at http://policies.ncsu.edu/regulation/reg-02-20-04.

Policies on Incomplete Grades

If an extended deadline is not authorized by the instructor or department, an unfinished incomplete grade will automatically change to an F after either (a) the end of the next regular semester in which the student is enrolled (not including summer sessions), or (b) the end of 12 months if the student is not enrolled, whichever is shorter. Incompletes that change to F will count as an attempted course on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student. The university policy on incomplete grades is located at http://policies.ncsu.edu/regulation/reg-02-50-3.

Late Assignments

All due dates are firm and no late work will be accepted, no exception. Computer failures, lost files, sickness or other difficulties are not valid excuses for submitting an assignment late.

Attendance Policy

For complete attendance and excused absence policies, please see http://policies.ncsu.edu/regulation/reg-02-20-03

Attendance Policy

Students are required to attend each class period; no excused absences are permitted for the course.

Makeup Work Policy

- There is no make up for homework assignments.
- Students who are unable to attend an exam for a legitimate unavoidable reason may take a make-up exam only if they provide suitable documentation. According to university policy, a student must notify the instructor in advance if s/he will miss an exam. If it is not possible to notify the instructor in advance, the instructor must be given notice as soon as possible after the exam.
• **Suitable documentation of an absence:** Examples include a physician’s note in case of illness or letter from the University or a student's advisor. Students who have a personal emergency (extreme family illness or death, etc.) should contact the Division of Academic & Student Affairs (515-2446; http://dasa.ncsu.edu/) to obtain documentation.

**Academic Integrity and Honesty**

• Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at http://policies.ncsu.edu/policy/pol-11-35-01

• See http://policies.ncsu.edu/policy/pol-11-35-01 for a detailed explanation of academic honesty.

• Copying someone else's work and presenting it as your own is plagiarism. Plagiarism, cheating, and other forms of academic dishonesty will not be tolerated. To create a fair and equitable environment, the instructor aggressively enforces the universities policies on academic misconduct. Although working together on written assignments to overcome obstacles is encouraged, each student must compose and write their own analysis and reports. All cases of academic misconduct will be handled as set out in university policies.

**Honor Pledge**

Your signature on any test or assignment indicates "I have neither given nor received unauthorized aid on this test or assignment."

**Electronically-Hosted Course Components**

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

**Accommodations for Disabilities**

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (http://www.ncsu.edu/dso), 919-515-7653. For more information on NC State’s policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at http://policies.ncsu.edu/regulation/reg-02-20-01.

**Non-Discrimination Policy**

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or
sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State’s policies and regulations covering discrimination, harassment, and retaliation may be accessed at http://policies.ncsu.edu/policy/pol-04-25-05 or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

Tentative Course Schedule

NOTE: The course schedule is subject to change.

- Week 1: Chapter 1 - Introduction
- Week 2: Chapter 2 - Probability, including: events, conditional probability, independence, etc
- Week 3: Chapter 3 - RV and probability distribution
- Week 4: Chapter 4 - Expectation
- Week 5: Some discrete distributions
- Week 6: Some continuous distributions
- Week 7: Exam 1 in class on October 1 (covers Chap1 - Chap 5)
- Week 8: Chap 7 - Function of RVs (Fall break)
- Week 9: Chap 7 - Chap 8 - Sampling distributions
- October 16, 2015: Last day to drop a course without a W grade
- Week 10: Chap 8 - Chap 9
- Week 11: Chap 9 - Estimation
- Week 12: Chap 10 - Hypothesis
- Weeks 13: Chap 10 - Chap 11 - Linear regression, ANOVA
- Week 14: Exam 2 in class on November 19 (covers Chap 6 - Chap 10.4)
- Week 15: Chap 11
- Week 16: Chap 11
- Dec 15, 2015: Final Exam for ST515, 1-4pm in our regular classroom