ST 305: Statistical Methods
Fall 2016

Time and Location: Tu Th 1:55PM - 3:35PM at 404 Mann Hall
Course structure: 100-minute lectures on Tu and Th (4 credit hours)
Course Web Site:  https://wolfware.ncsu.edu
Instructor:  Jung-Ying Tzeng
    Email: jytzeng@stat.ncsu.edu
    Office: 305 Ricks Hall
    Phone: 919-513-2723
    Office Hours and Location: Wednesdays 2-3pm or by appointment at 305 Ricks Hall

Teaching assistant: Ye Liu
    Email: yliu87@ncsu.edu
    Mailbox: 4260 SAS Hall (where you turn in late homework with extension permissions)
    Office Hours: Mondays 1-2pm and Tuesdays 9-10am
    Location: 1101 SAS Hall

Course Goal:
This course is intended to give students a background on the methods of statistical analysis. Students will learn  
(1) basic concepts of data collection, sampling, and experimental design; (2) descriptive analysis and graphical  
displays of data; (3) probability concepts, expectations, Normal and binomial distributions; (4) sampling  
distributions and the Central Limit Theorem; (5) statistical inference including estimation and hypothesis testing.

Textbook:
W.H. Freeman and Company. It will be ok to use an earlier edition of the text for this course. We will cover most  
of Chapters 1-13.

The book’s website, http://bcs.whfreeman.com/ips7e, has a number of useful free resources. Most importantly,  
some larger datasets used in the HW problems are available for download, which will keep you from having to  
type them by hand into your statistics software.

Course Notes:
Course notes of the week will be available on the course moodle site (https://wolfware.ncsu.edu) 24 hours prior  
to Tuesday’s lecture. Please print and bring them to class with you.

Grades:
• Your final grade in this course will depend on the following:

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
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<tbody>
<tr>
<td>HW Assignments</td>
<td>20%</td>
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<tr>
<td>2 Midterm Exams</td>
<td>23%×2 = 46%</td>
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<tr>
<td>In-class quizzes/exercises</td>
<td>4%</td>
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<tr>
<td>Cumulative Final Exam</td>
<td>30%</td>
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<tr>
<td>Total</td>
<td>100%</td>
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• All grades (HWs, midterms, exercises and final) will be stored in WebAssign Grade Book. It is the student’s responsibility to be aware of his/her grades in the course and the appropriate level of work required.

• Grades will be determined by calculating the student’s percentage out of the available points. Students achieving >=90% will receive at least an A-; students achieving >=80% will receive at least a B-; students achieving >=70% will receive at least a C-. A+ is reserved for the top 10%, and incomplete (IN) grades are given only as specified in university regulations.

Homework:
• HW problems will be assigned on weekly basis (typically given in the evening of Thursdays and due a week later at the beginning of the class). Assignments will be posted on WebAssign (https://www.webassign.net/ncsu/login.html), and each assignment may include a mixture of
  o WebAssign questions (which will be delivered and graded through WebAssign), and
  o TA-graded questions (which should be submitted at the beginning of class on the due day. If turned in at the end of the class, 5% penalty will be imposed, i.e., you earn 95%× the originally score.)

Late homework will not be accepted unless you use an “extension request” (see below). Please feel free to discuss the homework with me or TA.

• HW Extension Request: Each student can have 3 extension requests on homework during the semester. Each extension request will grant a 3-day extension, e.g., one may obtain an extension to Sunday 11:59pm for a HW due at 1:55pm on Thursday. This is partially designed to cover the cases being sick, being busy, having time conflict, or for any unexpected scenarios that prevent you from finishing the assignments in time.
  o To request an extension, please EMAIL the TA and cc me (and please do NOT request extension via WebAssign system because such messages are not checked on regular basis and will cause delay for TA to grant you the extension).
  o You do not need to give a reason when you plan to use your extension.
  o You can still request an extension after the due day, but the extension will be till 3 days after the original due day (e.g., for a HW due on the previous Thursday, you can still request an extension on Saturday but it will be due on Sunday 11:59pm). This will allow us to post the answer keys and solutions on Monday. No extensions will be accepted once the answer keys and solutions become available.

• Alternatively, you can contact the TA and me in advance if you are going to miss homework due day; you can choose to turn it in earlier.

In-class quizzes/exercise:
• There will be several in-class quizzes/exercises (not pre-announced) through the semester. Quizzes will be open notes and open book.

• There will be NO make-up quizzes/exercises. However, the lowest score will be dropped, which is partially designed to cover the cases that you are busy, sick, or for any unexpected scenarios that prevent you from coming to class on the quiz day.

Exams:
• There will be two midterms and one cumulative final exam.

• All exams are closed-book. For the exams, students may use one 8 ½ X 11 page of notes (front and back). For the final exam, students may use three 8 ½ X 11 pages of notes (front and back). Calculators are needed on exams. Cell phones and other electronic devices cannot be used for calculators and are forbidden in quizzes and exams. If any electronic devices other than a calculator is seen during an exam, the student will automatically receive a zero for that exam.
• Requests for re-grading of exams must be made in writing and within one week of the date that the exam is originally returned.

• The exams will be held on the following dates:
  o Midterm I:  Th 10/4/2016, in class
  o Midterm II: Th 11/3/2016, in class
  o Final: Tu 12/6/2016, 1pm-4pm in our classroom

• Make-up midterm exams are strongly discouraged and are only given if BOTH of the following two conditions are fulfilled:
  (a) Contacting the instructor within 24 hours of the exam given, and
  (b) Providing suitable and official documentation of the absence.

If you are aware of a scheduling conflict with an exam date, please let me know as soon as possible and no later than a week from the exam date; it is preferred that you arrange to take the exam early.

• For Final exam, the only reasons to reschedule are
  (a) A direct conflict with another final exam
  (b) Three final exams in one day

If you have either of these issues, you will need to see the Office of Registration and Records (1000 Harris Hall) to obtain an exam reschedule form, which will allow us to reschedule the final exam on individual basis.

Auditing:
Auditors are expected to attend class regularly and submit homework assignments on the same schedule as the other students. The final grade for auditors (AU or NR) will be based on their final written assignment average.

Classroom discipline:
• Please be respectful of your classmates and instructors by coming to the class in time and putting your cell phone off before entering the class. Good class participation may increase the chance of getting a good grade. You should bring your course handouts and a calculator to the class.

• The use during class of cell phones and other devices for text messages, internet browsing, emails etc. is (a) very distracting to both the instructor and nearby students and (b) incredibly rude. It will not be tolerated in class. A warning will be issued the first time you are round texting, messaging etc. in class. Each subsequent time you will lose one point from your final course average.

• Regular class attendance is strongly encouraged. If you miss class for any reasons, please make arrangements with another student to obtain the notes and materials that were covered that day. Additionally, students should check their Unity email regularly to receive course announcements.

Disability Services for Students:
Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 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 (REG 02.20.01).

NCSU Policies, Regulations, and Rules (PRR):
Students are responsible for reviewing the PRRs which pertain to their course rights and responsibilities. These include:
  http://oied.ncsu.edu/oied/policies.php (Office for Institutional Equity and Diversity),
http://policies.ncsu.edu/policy/pol-11-35-01 (Code of Student Conduct), and http://policies.ncsu.edu/regulation/reg-02-50-03 (Grades and Grade Point Average).

Class evaluation:
- Online class evaluations will be available for students to complete during the last 2 weeks of the semester then become unavailable at 8am on the first day of finals for the full Spring Semester.
- Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will not know how any one student responded to any question, and students will not know the ratings for any instructors.
- Evaluation website: http://go.ncsu.edu/cesurvey
- Student help desk: claseval@ncsu.edu
- More information about ClassEval: http://oirp.ncsu.edu/eval/clev

Policy on Academic Integrity:
The Code of Student Conduct defines a university policy on academic integrity: http://policies.ncsu.edu/policy/pol-11-35-01. Your signature on work submitted for grading implies compliance with this policy. Cheating, plagiarism and other forms of academic dishonesty will not be tolerated. Violation of the Code of Student Conduct will be reported and severe penalties will be enforced.

Course Outline:
The following is an outline of the course. Please note that this schedule may be adjusted.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics (Subject to change)</th>
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<tbody>
<tr>
<td>1,2</td>
<td>Introduction Ch1: Looking at data (distributions) --- using graphical methods &amp; numerical methods</td>
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<tr>
<td>2,3</td>
<td>Ch4: Probability and random variables</td>
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<td>4</td>
<td>Ch5.2: Discrete random variables and probability distribution; binomial random variable Ch1.3: Continuous random variables and probability distribution; normal random variable</td>
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<td>5</td>
<td>Ch5: Sampling distribution</td>
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<td>6</td>
<td>Ch6: Introduction to inference --- Estimation</td>
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<td>7</td>
<td>Ch6 &amp; 7: Introduction to inference --- Hypothesis testing (general concepts)</td>
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<td>8</td>
<td>Midterm I (Tu, 10/4, in class)</td>
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<td>9</td>
<td>Ch6 &amp; 7: Introduction to inference --- Hypothesis testing for the mean of a population</td>
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<tr>
<td>10</td>
<td>Ch2: Overview of bivariate data analysis Ch7: Inference for comparing two means</td>
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<tr>
<td>11</td>
<td>Ch12: Analysis of variance (ANOVA)</td>
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<td>12</td>
<td>Midterm II (Th, 11/3, in class)</td>
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<td>13,14</td>
<td>Ch2, 10 &amp; 11: Regression analysis</td>
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<tr>
<td>15, 16</td>
<td>Ch8 &amp; 9: Categorical data analysis Special topics: bootstrap; non-parametric tests</td>
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<td></td>
<td>Final Exam (Tuesday, 12/6, 1pm-4pm, in our regular classroom)</td>
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