Full Syllabus

ST 101 – Statistics By Example

Section 001
Fall 2016
3 Credit Hours

Course Description
Sampling, experimental design, tables and graphs, relationships among variables, probability, estimation, hypothesis testing. Real life examples from the social, physical and life sciences, the humanities and sports. Credit not allowed if student has prior credit for another ST course.

Learning Outcomes
This course will enable you to:
   i) incorporate statistical thinking into your everyday lives;
   ii) apply the necessary data-gathering, data-analysis, and interpretation/communication expertise to meet the challenges of a more demanding cognitive global environment.

ST101 is NOT a math course. "Beyond the formula" skills are emphasized. This course will require you to: think critically, be skeptical, think about variation (rather than just about the center), move beyond a "memorize the answer" approach, and think about conditional probabilities and rare events (humans just don't do the latter very well). Some mathematical skill is required to work with elementary statistics, but mathematical manipulations will be replaced by relying on technology for the calculations and graphics. This course requires more intellectual effort than the low mathematical level suggests! It is related to every other course you may study. The course is elementary in mathematical level but conceptually rich in statistical ideas and serious in its aim to improve your data-analytic skills and your ability to apply statistical methods with understanding.

Course Structure
This course is taught in a student-centered manner and will include periods of lecture, discussion, and group activities.

Course Policies

- Students are expected to check their unity email and the course website regularly for announcements and materials.
- When e-mailing the instructor or teaching assistant, please use proper etiquette.
- Courtesy and Respect in the classroom is expected (both ways).
- Please come on time and do not start packing up before class is over.
- Please turn off or silence all cell phones before class begins.
- Please bring a calculator (that is not your cell phone) to class.
- Laptop computers or tablets may only be used to take notes or analyze data as part of a class activity. If you are seen using a computer for anything else, you will be restricted from using it for the rest of the semester.
- I reserve the right to change any policy given, or add new policies as I feel appropriate.
Instructors

- Herle M McGowan (hmmcgowa) - Instructor
  - Email: hmmcgowa@ncsu.edu
  - Phone: 919-515-0634
  - Office Location: 5266 SAS Hall
  - Office Hours: MW 1:30-3pm
- Jesse Clifton (jcliftio) - Teaching Assistant
  - Email: jcliftio@ncsu.edu
  - Office Location: 1101 SAS Hall
  - Office Hours: Tu 11:50-1:20 and Th 2:40-3:10

Course Meeting
Tu/Th 1:30 pm - 2:45 pm, 222 Daniels Hall (Main Campus). This meeting is required

Course Materials

- There is no required textbook for this course.
  - If you are looking for a reference, I would recommend: Statistics, Concepts and Controversies by David Moore and William Notz.
- Basic Calculator - Cost varies
  - This material is required.
- Statcrunch Statistical Software - Free
  - This material is required.
- Note Outlines - Free
  - This material is required.

Requisites and Restrictions
Prerequisites
None.
Co-requisites
None.
Restrictions
None.

General Education Program (GEP) Information
GEP Category
Mathematical Sciences
GEP Category Objectives
Each course in Mathematical Sciences will provide instruction and guidance that help students to:
  - improve and refine mathematical problem-solving abilities; and
  - develop logical reasoning skills.
GEP Co-requisites
This course does not fulfill a General Education Program co-requisite.

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**

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<th>Grade Components</th>
<th>Weight</th>
<th>Details</th>
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<td><strong>In-class Activities</strong></td>
<td>100 points</td>
<td>Each class period, students will complete activities and exercises that illustrate course content. Select activities will be collected and graded on content and presentation. No late activities will be accepted; students who do not attend these classes will receive a zero for that day’s participation. The lowest three activity scores will be dropped.</td>
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| **Weekly Quizzes** | 100 Points | There will be weekly quizzes. These will be due every Tuesday by 1:30pm, starting on August 30. Quizzes will be posted on Moodle one week before they are due, and submitted via the website.  
- You have two attempts per quiz. Your final score will be the average of the scores for your two attempts, so it is important that you try your best on the first attempt.  
- Quizzes are open notes, open book. Students are encouraged to discuss concepts together, but copying is strictly prohibited.  
- No late quizzes will be accepted for any reason. No quizzes will be reopened for any reason. If you do not submit a quiz, you will receive a score of zero.  
- The lowest two quiz scores will be dropped. |
| **Midterm Exam** | 100 Points | All exams are closed book.  
- For the 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. Cell phones, tables, or other electronic devices may not be used as calculators (or time keeping devices).  
- 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 instructor within two weeks of the day exams are returned in class. |
Component | Weight | Details
--- | --- | ---
Cumulative Final Exam | 200 Points | • All exams are closed book.  
• For the final exam students may use two 8 ½ X 11 page of notes (front and back).  
• Basic calculators (such as TI-83) may be used on all exams. Cell phones, tables, or other electronic devices may not be used as calculators (or time keeping devices).

**Letter Grades**

*This Course uses Standard NCSU Letter Grading:*

| Grade | 97 ≤ A+ ≤ 100 | 93 ≤ A ≤ 97 | 90 ≤ A- < 93 | 87 ≤ B+ < 90 | 83 ≤ B < 87 | 80 ≤ B- < 83 | 77 ≤ C+ < 80 | 73 ≤ C < 77 | 70 ≤ C- < 73 | 67 ≤ D+ < 70 | 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](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](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-02-50-03](http://policies.ncsu.edu/regulation/reg-02-50-03).

**Late Assignments**

No late work will be accepted for any reason.

**Attendance Policy**

- For complete attendance and excused absence policies, please see [http://policies.ncsu.edu/regulation/reg-02-20-03](http://policies.ncsu.edu/regulation/reg-02-20-03)
- Attendance and participation are required at all regularly scheduled meetings of the course, and will be tracked through completion of in-class activities.
- Students are allowed up to 3 absences without needing documentation or needing to contact the instructor. Students who miss more than 3 classes need to speak with the instructor as soon as possible; documentation justifying the absences will be required (see next section for information on obtaining acceptable documentation).

### Makeup Work Policy

- There is no make-up work for the in-class activities or quizzes.
- 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 an absence verification officer (absence-verification@ncsu.edu) to obtain documentation.

### Academic Integrity

**Academic Honesty**

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

**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.

**Electronically-hosted Components:** Moodle, Email

### 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](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](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. 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.

Course Schedule
NOTE: The course schedule is subject to change.

- Week 1: Introduction and Overview
- Week 2: Comparing two groups—Data Collection (Experiments vs. Observational Studies)
- Week 3: Comparing 2 groups—Inference (Logic of Hypothesis Testing)
- Weeks 4-6: Comparing 2 groups—Inference (Hypothesis Testing and Randomization Tests)
- Weeks 6-7: Learning about one variable—Data Collection (Sampling Methods, Bias and Variability)
- Week 8: Midterm exam, October 4 in class
- Week 9: Learning about one variable—Inference (Logic of Estimation)
- Weeks 10-12: Learning about one variable—Inference (Confidence Intervals and Hypothesis Tests); Data visualization
- Weeks 13 and 14: Relationships between two variables (Correlation, Simple Linear Regression, Inference)
- Week 15: Bringing it all together
- Week 16: Wrap up and Review
- Final Exam—December 6, 2016 from 1-4 pm in our regular classroom