ST 517 Course Syllabus

ST 517 – Applied Statistical Methods I

Section TBD

Summer I 10 Week 2019

3 Credit Hours

Course Description

This first course in statistics for graduate students is intended to give students a background in the statistical methods that will assist them in the analysis of data. Students will learn methods for summarizing and describing data in addition to techniques for using sample data to make inferences about a larger population. This is a calculus-based course. Students will be introduced to statistical software; however, there is not a lab associated with this course.

Learning Outcomes

By the end of the course, students will be able to:

- Describe fundamental principles of data collection, determine situations where errors in data collection arise, and provide basic solutions to avoid or account for possible errors in the data collection process.
- Produce and analyze appropriate graphical and numerical summarization techniques for different types of data.
- Properly utilize probability distributions to determine probabilities and account for variability in statistics.
- Make inference and/or prediction using an appropriate hypothesis test, confidence interval, and/or regression model.

Course Structure

Students in this course do not attend a typical class period. Instead students will receive course content through online presentations and activities. Students should set aside sufficient time in their schedules to complete these materials.

Course Policies

Students are expected to check their NCSU email regularly to receive course announcements. Students who do not use their NCSU email should arrange to have this email forwarded to an account they do use. Due to university regulations the instructor can send course announcements only to NCSU email addresses.

- Weekly emails with important information and due dates will be sent via the Moodle announcements feature; additional announcements may be sent as necessary. All announcements will also be available via the link at the top of the course Moodle page.
- Posts to the Student to Student Discussion Forum (for asking questions about course content) will be sent as email to the entire class (including the instructor and TA). Subscription to this forum is optional but recommended. While these posts will also be available via a link at the top of the course Moodle page, they are not easily searchable in that format.
- It is recommended you save the emails from throughout the semester for quick searching and referencing later.
Instructors

**Herle M McGowan** (hmmcgowa) - *Instructor*

**Email:** hmmcgowa@ncsu.edu  
**Phone:** 919-515-0634  
**Office Location:** SAS Hall  
**Office Hours:** TBA

Course Meetings

Students in this course do not attend a typical class period. Instead students will receive course content through online presentations and activities. Students should set aside sufficient time in their schedules to complete these materials.

Course Materials

**Textbooks**

An Introduction to Statistical Methods and Data Analysis - *R. Lyman Ott and Michael T. Longnecker*

- **Edition:** 7th edition  
- **ISBN:** 1305269470  
- **Cost:** 200

*This textbook is optional.*

**Expenses**

None.

**Materials**

Access to a computer. - 0

*This material is required.*

Requisites and Restrictions

**Prerequisites**

Graduate standing, MA 241 or equivalent (Calc II)

**Co-requisites**

None.

**Restrictions**

None.

General Education Program (GEP) Information

**GEP Category**

This course does not fulfill a General Education Program category.

**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

Item Points
Midterm Exam 200
Online Quizzes 100
Online Discussion Postings 50
Comprehensive Final Exam 150

Total 490

Quizzes: Throughout the semester there will be 9 online quizzes assigned, each worth 20 points. The lowest two quiz scores will be dropped. Students will have one attempt per quiz. These online quizzes will help students insure that they have mastered the material. Each quiz will be tied to course content modules posted to the course website. Students should work through the modules before attempting these quizzes. Quizzes are presented in Moodle and are taken online. There is NO time limit on quizzes. Students may work on a quiz over multiple days and save their answers before submitting a quiz. Some questions will be multiple choice or numeric response; these will be automatically graded. Other questions will require students to upload a written response that will need to be manually graded. Quizzes will generally be due on Tuesdays and Fridays each week; see Moodle for specific due dates. No late quizzes will be accepted, and no quizzes will be reopened for any reason.

Exams: All exams are closed book. For the midterm exam students may use one 8 ½ X 11 page of notes (front and back). For the final exam, students may use two 8 ½ X 11 pages of notes (front and back). Basic calculators (such as TI-84) may be used on all exams. Students may take the exam on either of the two days listed in the course outline below. The midterm exam is limited to 1.5 hours. The final exam is limited to 3 hours. Exam proctoring: Students must arrange to take their exams during the assigned two day window. Students may take exams in their choice of two possible methods.

• Through the Distance Education Proctoring Offices. Students who are within 50 miles of NCSU's campus may arrange to take their exams at the DE Proctoring offices on a walk in basis.

• Off campus proctoring. Students who are not in Wake County or the adjoining counties or have extenuating circumstances may take exams through an approved proctor. All remote proctoring should be arranged through the Distance Education Proctoring Office at least one week prior to the exam dates.

• Please note that the instructor does not communicate directly with proctors. Please refer all questions regarding proctoring to the distance proctoring center (deproctor@ncsu.edu).
Making up exams: Students who are unable to attend an exam for a legitimate unavoidable reason may take a make-up exam only if the student provides suitable documentation (such as a note from a physician) of the absence. Students who have a personal emergency (extreme family illness or death, etc) should contact the Absence Verification Officer (absenceverification@ncsu.edu) to obtain documentation; see dasa.ncsu.edu/students/absenceverification-process/ for more information. 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.

Discussion Board Postings: Student in this course will be broken into small groups of 3 to 5 students. Twice a week, typically Tuesdays and Fridays, these groups will answer questions and discuss course content using the online discussion board; see Moodle for specific due dates. Due dates are firm and your fellow group members will be counting on your contributions to be submitted by the due date. Discussion postings will be graded based on quality of responses.

Students are expected to treat each other with respect on the boards; postings that are disrespectful will receive a score of zero.

Grade Components
Letter Grades

This Course uses Standard NCSU Letter Grading:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score</th>
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<tbody>
<tr>
<td>A+</td>
<td>97 ≤</td>
</tr>
<tr>
<td>A</td>
<td>93 ≤</td>
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<tr>
<td>A-</td>
<td>90 ≤</td>
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<tr>
<td>B+</td>
<td>87 ≤</td>
</tr>
<tr>
<td>B</td>
<td>83 ≤</td>
</tr>
<tr>
<td>B-</td>
<td>80 ≤</td>
</tr>
<tr>
<td>C+</td>
<td>77 ≤</td>
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<tr>
<td>C</td>
<td>73 ≤</td>
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<tr>
<td>D-</td>
<td>60 ≤</td>
</tr>
<tr>
<td>F</td>
<td>0 ≤</td>
</tr>
</tbody>
</table>

Requirements for Credit-Only (S/U) Grading

Performance in research, seminar and independent study types of courses (6xx and 8xx) is evaluated as either "S" (Satisfactory) or "U" (Unsatisfactory), and these grades are not used in computing the grade point average. For credit only courses (S/U) the requirements necessary to obtain the grade of "S" must be clearly outlined.

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 Graduate School, 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) by 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. Additional information relative to incomplete grades for graduate students can be found in the Graduate Administrative Handbook in Section 3.18.F at http://www.fis.ncsu.edu/grad_publicns/handbook/.

**Late Assignments**

No late assignments are accepted.

**Attendance Policy**

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

**Attendance Policy**

This is an online course, students should be sure to make enough time to complete their work.

**Absences Policy**

NA

**Makeup Work Policy**

No late work is accepted.

**Additional Excuses Policy**

None.

**Academic Integrity**

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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

**Academic Honesty**

See 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.

**Accommodations for Disabilities**

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Resource Office at Suite 304, University College Commons, 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 (REG02.20.01) (https://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.

**Course Schedule**

(Note that the course schedule is subject to change)

- **Week 1-2** (half-week): Data collection
- **Week 3-6**: Random Variables and Probability Distributions; Famous Distributions (Binomial, Normal); Advanced topics in distribution (joint distributions, linear combinations, sampling distributions)
- **Week 7-9**: Estimation (MLE, CI for mu); Hypothesis tests (for mu)
- **Week 10-12**: Additional topics in inference (errors, power, 2-sample tests); Inference for categorical data
- **Weeks 13-15**: Regression and correlation (simple linear regression, multiple regression, model fitting)
- **Week 16**: Wrap up and review