

Math 117Q Fall 2017 Syllabus

Instructors: P. Oser (poser3@emory.edu), K. Rogers (karen.m.rogers@emory.edu)

Text: Elementary Statistics, 12th or 11th edition, Mario F. Triola

Software & Materials: R statistics software (free at www.r-project.org),
Microsoft Excel, and a calculator (recommended models:
TI-83, TI-83+, TI-84, TI-84+, or TI-Nspire)

Course Content:

With a focus on applications of classic statistical methods in the natural sciences, this course will cover visual displays of data, elements of experimental design, measures of central tendency and of variability, classification of data, counting, probability, Chebyshev's Theorem, normal distribution, binomial distribution, Central Limit Theorem, hypergeometric distribution, Poisson distribution, Confidence Intervals, Hypothesis testing (means, proportions, variances), Simple linear regression and correlation, Analysis of Variance (one way), Chi Square Tests (Goodness-of-fit, Contingency Tables), Nonparametric methods (Wilcoxon [for independent samples], Kruskal Wallis, Spearman's ρ), as well as practical training in using both R and Excel for data processing and analyses. Emphasis is on inference.

Goals:

Broadly, students should become good consumers of information through their gained knowledge about statistics; become competent in the processes of statistical analysis and inference; and become proficient at doing these things using a variety of tools (e.g., R and Excel). More specifically, students should be able to:

- Categorize data sets;
- Correctly work various simple probability problems;
- Articulate the role of certain functions in statistics;
- Describe major misuses of statistics;
- Recognize several distributions and characterize them;
- Analyze interval data using statistical tests involving means, proportions, medians, rankings, and variances as appropriate;
- Interpret relationships in bivariate data;
- Discuss the difference between parametric and nonparametric statistics in relation to inherent assumptions of the general statistical model;
- Interpret the role of statistics in analyzing data and in inference;
- Recognize and explain the limitations of statistics;
- Interpret statistical findings in relation to the situation from which the data was drawn;
- Describe the experimental nature of mathematical statistics;
- Draw inferences using the vocabulary of statistics;
- Conduct basic data processing and statistical analysis using both R and Excel.

Grading:

Grades will be determined by student performance on quizzes, tests, assignments, and a comprehensive final exam, as follows:

3 quizzes (20 pts each)	60 pts
4 tests (100 pts each)	400 pts
4 inquiry-based projects (60 pts each)	240 pts
1 final project	100 pts
Final exam	200 pts
<hr/>	
Total:	1000 pts

In general, a 10% scale will be used to determine letter grades (e.g. A's for scores of 900 or above, B's for scores between 800 and 899 points, etc.) Exact cut-off scores for +/- grades will be determined by the distribution of totals for all students, and at the discretion of the instructors.

Tests and Final Exam:

Tests will be given during class time on the dates indicated on the class schedule provided online. Students may use their calculators for certain portions of tests, experiments, and the final exam, as indicated by the instructors. Students are expected to take tests at the scheduled times. Any emergencies will be handled on an individual basis and must be documented. No make-up test will be given after the testing time and date. The final exam will include material selected from the entire course and will be given at the time designated on the college's final exam schedule, no exceptions.

Inquiry-Based Projects:

Students will be required to work in groups for certain inquiry-based projects. These projects are intended to not only reinforce the basic statistical concepts taught during class, but also to engage students with processing data and doing statistical analysis in the contexts of R and Excel.

Students will also be required to do an independent statistical study of their own design as a final project. This will include negotiating with the instructor to assure the study is at an appropriate level of complexity, designing an appropriate experiment, collecting data, performing appropriate statistical tests, making inferences and summarizing the results in a professional manner.

These inquiry-based projects will be due at class time on the due date specified in the class schedule provided online.

Homework:

Homework problems will not be collected but are assigned to benefit the student. Each student should work the problems assigned in the text and in the materials provided online. To do well, the average student should plan on studying and doing practice problems for about 3 hours outside of class for each class meeting held. Preparing group assignments, studying and reviewing for tests will require more time.

Attendance:

Students are expected to attend all classes, and are responsible for all work covered in class. As previously mentioned, tests will not be given after the posted test date. Students missing a test will not have the opportunity to make up that test. Emergencies and verifications are at the discretion of the professor. Arrangements made related to grading due to an absence from a test are at the discretion of the professor. Absences from tests must have appropriate documentation.

Finding Help:

- There is a class conference on Canvas and a related class website at

<http://mathcenter.oxford.emory.edu/math117/>

Students should consult both of these resources frequently for announcements about office hours, SI sessions, tutoring, homework assignments, class notes, outlines for tests, etc.

- Office hours will be announced by the instructors. Students can use this time to come by and ask specific questions related to this course and/or homework problems. In addition, students may email instructors privately.
- There are SI (Supplemental Instructor) student leaders attached to this course that will schedule review sessions each week. These sessions are optional, however each student is encouraged to pick one of the times per week and attend regularly. Note, students who attend SI sessions on a regular basis generally end up performing better in the course.
- Student tutors are available for one-on-one assistance with the material in the Math Center. The Math Center is normally located in Pierce Hall, but due to construction during the spring and fall semesters of 2017 has temporarily relocated to the bottom floor of the Oxford Science Building (OSB).
- Study groups organized by students have historically been very beneficial, as well. To be effective, meetings should be scheduled weekly and should be part of a regular weekly routine.

Special Accommodations:

Access, Disability Services and Resources (ADSR) works with students who have disabilities to provide reasonable accommodations. In order to receive consideration for reasonable accommodations, students must contact ADSR and complete the registration process. Faculty may not provide disability accommodations until an accommodation letter has been processed; accommodations are not retroactive. Students registered with ADSR who receive a letter outlining specific academic accommodations are strongly encouraged to coordinate a meeting time with their professor to discuss a protocol to implement the accommodations as needed throughout the semester. This meeting should occur as early in the semester as possible. Contact Access, Disability Services and Resources for more information at (770) 784-4690 or adsroxford@emory.edu. Additional information is available at the ADSR website at <http://equityandinclusion.emory.edu/access/students/index.html>.

HONOR CODE:

THE HONOR CODE APPLIES TO ALL WORK SUBMITTED FOR CREDIT POINTS TOWARD YOUR GRADE. ALL SUCH WORK WILL BE PLEDGED TO BE YOURS AND YOURS ALONE. YOU PLEDGE THAT WITH YOUR SIGNATURE. THE CONTRIBUTION SHEET WITH EACH OF YOUR GROUP ASSIGNMENTS PROVIDES YOUR INDIVIDUAL WORK WITHIN THE GROUP STRUCTURE.