

STA 5939
Introduction to Statistical Consulting
FALL SEMESTER 2020

Instructor: Xu-Feng Niu
Office: 210B OSB niu@stat.fsu.edu
Class Hours: 5:15pm - 6:30pm MW (Via Zoom)
Office Hours: 1:00pm - 2:00pm MW (Via Zoom)

Course description and topics: This course will be taught remotely and synchronously via Zoom. Videos of the lectures will be available after classes for international students who take the courses remotely.

The course will focus on formulation of statistical problems from client information, the analysis of complex data sets by computer software, and practical consulting experience. Experience will be gained through actual consultation with researchers who have a real problem with relevant data. Topics of this course will include

- 1) Special experimental designs (Split-Plot, Repeated Measures);
- 2) Linear and non-linear mixed-effects models;
- 3) Generalized linear and additive models; 4) Multiple comparisons;
- 5) Sample size determination; 6) Time series data analysis.

The course will use “SAS” and “R” as the main statistical computing packages. Students in the course are required working on statistical consulting projects and will receive data to use in the class from on campus sources or from clients while working paid or unpaid internships.

Course objectives: Upon completion of this course students will be able to

- 1) Communicate effectively with future clients and form statistical problems in different situations;
- 2) Work on statistical data analysis projects independently;
- 3) Prepare progress reports and final reports of research projects;
- 4) Present statistical results clearly to clients and in conferences.

Prerequisites: STA5167 or STA5327 or consent of the instructor.

Course Grading:

Grading will be based on reports and presentations prepared for the consulting projects (20% for attending the Data Science workshops and quizzes, 30% for the progress report and presentation, 40% for the final report and presentation, and 10% for class attendance, periodic assigned oral reports, and discussion.)

Attendance Requirement: Students are required to attend all the classes. If you have 3 or more unexcused absences you will fail the course or get an incomplete.

University Policies

University Attendance Policy:

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy:

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to . . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University. (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>.)

Americans With Disabilities Act:

Students with disabilities needing academic accommodation should:

- (1) register with and provide documentation to the Student Disability Resource Center; and
- (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
<http://www.disabilitycenter.fsu.edu/>

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Course Project:

A data analysis project is required for this course. You may find a data set by yourself or through online data libraries. Topics for the project might be on experimental design, analysis of variance, regression, generalized linear models, time series, machine learning, or others. The length of the project is expected to be 20-30 pages, including figures and tables. For the manuscript preparation of your project, Latex or Word is preferable. The written document should include:

- a clear and detailed description of the problem background and of the data associated with it.
- a precise statement of the substantive questions to be addressed by the analysis.
- a complete description of the methods used in the analysis.
- conclusions and discussion.

Please submit a two-page outline of your project to me before October 1st. Your 10-minute progress report and presentation will be conducted before November 20th (5 speakers in a lecture, three lectures). A final oral presentation of your project will be made in the final examination week. Each of you will be given about 15 minutes to present the main points of your project. The written document along with a PPT presentation of your project is due December 10th, Thursday of the final examination week.

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Tentative Syllabus

Topic	Source
Multiple comparisons;	SAS
Special experimental designs (Split-Plot, Repeated Measures);	SAS
Sample size determination;	R
Time series data analysis;	SAS and R
Generalized Linear Models	SAS and R
Linear and non-linear mixed-effects models;	SAS and R
Projects discussion and presentations	