

**STA 5166**  
**Statistics in Applications I**  
**FALL SEMESTER 2020**

Instructor: Xu-Feng Niu  
Office: 210B OSB niu@stat.fsu.edu  
Class Hours: 3:35pm -4:50pm MW (via Zoom)  
Office Hours: 2:00pm - 3:00pm MW (via Zoom)  
Text: Box, G. E., Hunter, W. G. and Hunter, J. S (2005), Statistics for Experimenters, John Wiley and Sons, Inc.

**Course Objectives:**

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.

Statistics is an applied science whose focus is upon the collection, analysis and interpretation of data. Statistics is also a mathematically-based theoretical science in which the theory necessary to carry out data analysis is developed. This course will focus on the design of experiments which is the most valuable aspect of statistical method. Frequently conclusions are easily drawn from a well-designed experiment, even when rather elementary methods of analysis are employed. Conversely, even with the most sophisticated statistical analysis can not salvage a badly designed experiment. The topics of this course will include comparison of two and more means, random sampling, randomization and blocking with paired comparisons, statistical inference for means, variance, proportions and frequencies, and two-way factorial designs and Latin square design.

The course will use “R” as the statistical computing packages. Each student should have a good calculator.

**Prerequisites:**

**Readings:** A-First-Course-in-Probability-8th-Edition; Introduction-to-Business-Statistics-7th-Edition;  
**MAC 3312 or consent of the instructor.**

**Course Grade:**

<b>Weights</b>		<b>Grading Scale</b>	
Quizzes	10%	90-100	A
Homework	20%	80-90	B
Midterm (Take Home)	30%	70-80	C
Final Project	40%	60-70	D
		Below 60	F

**Attendance Requirement:**

Students are required to attend all the classes. Missing three or more classes without a good excuse will fail the course or get an incomplete.

**Homework:**

Please do your homework on standard size paper (8.5 × 11in). If there is more than one page, staple the pages together. In data analysis problems, do not turn in reams of computer output. Include only those parts of the output which are most relevant for a final report. Tell in clear English the purpose of each step of the analysis, and tell what the plot or statistic shows.

## 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://dof.fsu.edu/honorpolicy.htm>.)

**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](mailto:sdrc@admin.fsu.edu)  
<http://www.disabilitycenter.fsu.edu/>

**STA 5166**  
**Statistics in Applications I**  
**FALL SEMESTER 2020**

**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, or others. The length of the project is expected to be 10-15 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 one-page outline of your project to me before November 10th. The written document along with a PPT presentation of your project is due December 10th, Thursday of the final examination week.

**STA 5166**  
**Statistics in Applications I**  
**FALL SEMESTER 2020**

**Tentative Syllabus**

<b>Topic</b>	<b>Source</b>
Introduction to the R language R Online Manuals:	An Introduction to R R Data Import/Export R Language Definition (Chapters 1-6)
Introduction of Applied Statistics	BHH Ch. 1.
Some Basic Probability and Statistical Concepts	BHH Ch. 2.
Comparing Two Entities: Reference Distributions, Tests, and Confidence Intervals	BHH Ch. 3
Comparing a Number of Entities: Randomized Blocks, and Latin Squares	BHH Ch. 4
Factorial Designs at Two Levels	BHH Ch. 5
Fractional Factorial Designs	BHH Ch. 6
Factorial Designs and Data Transformation	BHH Ch. 8
Multiple Sources of Variation	BHH Ch. 9