

## STA 4931, Statistics in Practice Course Syllabus Spring 2019

**Instructor:** Dr. Steven Ramsier

**Office:** 106A OSB

**Office hours:** 10:30 to 11:30 AM on Mondays and Wednesdays

**E-mail:** ramsier@stat.fsu.edu

**Phone:** 644-3218 (Main Statistics office phone – currently no direct line to the instructor)

**Fax:** 644-5271

**Class Meeting Times:** 9:30 to 10:45 AM Tu Th in 108 OSB

**Final Exam:** No final given

**Recommended Text:** Alley, M., *The Craft of Scientific Writing* (2018), Fourth Edition, Springer.  
ISBN-13: 978-1-4419-8287-2

Other references will be provided during the course of the semester.

**Prerequisite:** At least two STA 4000-level courses or instructor permission.

**Software:** Access to statistical software will be required. Packages such as *SAS*, *JMP*, and/or other tools will be used to complete analyses of data.

**Course Description:** This is a capstone course intended for statistics majors. The goal will be to enhance students' competencies by applying advanced statistical methodology to the challenges imposed by real data and developing writing skills to effectively communicate project requirements and findings. Students will be exposed to several aspects of statistical practices including elements of statistical consulting, study design, setting project goals and deliverables, applying appropriate methodology, performing accurate analyses, and providing clear and concise explanations of results.

**Course Objectives:** This course is designated as an *Upper-Division Writing* course.

*Upper-Division Writing Objectives.* By the end of the course, students will demonstrate the ability to:

- UDW1. Use appropriate evidence from multiple sources to illustrate how a chosen topic is relevant to a particular field.
- UDW2. Employ different resources (such as words, graphs, charts, and images) to compose in the field.
- UDW3. Compose as a process, including drafts, revision, and editing.
- UDW4. Convey ideas clearly, coherently, and effectively for a particular purpose, occasion, or audience as appropriate for the field.

*Competencies for Upper-Division Writing will be assessed through the assignments and the capstone project for which a standard rubric will be employed to facilitate the evaluation of written results.*

*General Course Objectives.* Students who complete this course will be able to:

- 5. Define the framework in which a statistical study is conducted.
- 6. Investigate modern statistical methods that extends beyond their current background.
- 7. Apply new statistical techniques in an appropriate way to real world problems.
- 8. Formulate client requirements from a consultation.
- 9. Create, organize, and carry out an actionable plan to meet the client's requirements.
- 10. Present the results of a statistical analysis to the client in a manner that fits the client's needs.
- 11. Critique statistical studies and their results based on a sensible consideration of the techniques employed and their limitations.
- 12. Perform a thorough statistical analysis in a logical manner starting from project definition, through data collection, data analysis using best practices, model assessment, and delivery of a solution in comprehensible terms to stakeholders.

**Grade Composition (1000 Points Total):**

Elementary Statistical Analysis (1 assignment, 200 words)	100
Advanced Statistical Analysis (3 assignments, 300 words each)	300
Consultation In-Class Evaluation (1 assignment)	100
Proposal Writing for a Professional Project (1 assignment, 400 words)	100
Capstone Project (1 assignment, 1500 words)	300
Participation	100
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Total (3000 words)	1000

**Grade Assignments (Based on total course points earned):**

A 930-1000	B- 800-829	D+ 670-699
A- 900- 929	C+ 770-799	D 630-669
B+ 870-899	C 730-769	D- 600-629
B 830-869	C- 700-729	F 0-599

**Assignments and Responsibilities**

**Elementary Statistical Analysis Assignment:** An assignment will be given that involves a real-world problem for which techniques that are familiar to the student should apply. The focus of this assignment is on effective communications encompassed in a statistical study. Students will work individually and will be presented scenarios in which they will need to collect data, analyze it using methods from their own background, and interpret the results. Students will first draft a memo-style report on their findings, receive feedback, edit and revise the report by incorporating suggestions, and submit the report for instructor grading. The report will consist of at least 200 words.

**Advanced Statistical Analysis Assignments:** These assignments will parallel the elementary statistical analysis above; however, they will focus on more advanced techniques that are not contained in the typical coursework leading up to this class. Students will be presented with the concept of the new technique but will be required to do some additional independent exploration on how it may be applied to the given scenario. Students will first draft reports in memo-style, receive feedback, and revise final reports in the first two of the exercises. The third exercise will only require a final draft. Each report will consist of at least 300 words.

**Consultation Assignments:** Scenarios will be provided where each student will get to play the role of statistical consultant. Students will practice the process of statistical consulting including greeting the client, understanding the client project, identifying client requirements, setting goals in client terms, formalizing goals in statistical terms, acquiring data, performing the statistical analysis, and discuss the results with the client in non-statistical terms.

**Proposal Writing for Professional Project Assignment:** In this assignment students will be provided a scenario for which a statistical study is required. Examples include a process improvement project, method or product comparisons, a validation study, or research topics from undergraduate honors thesis students. Students will be required to draft a proposal involving a situation description, explain the proposed solution, define the steps involved, give potential benefits, and cite potential roadblocks. Students will receive instructor feedback on the initial proposal, have the opportunity to make revisions, and submit a final draft. The proposal writing process will involve the composing at least 300 words.

**Capstone Project:** Students will work on an applications project during the course of the term. Each project will focus on a different element in the statistical modeling process. Students are encouraged to select a topic for which they are passionate about such that a research question may be formulated and corresponding data obtained. The data used will be of the student's choosing in consultation with the instructor so that initial guidance may be given to ensure an effective project. A final report will be drafted and revised based on feedback. The final report will be comprised of at least 1500 written words.

In general, the complete project consists of framing a real-world problem in the context of a statistical study, collecting a data set of interest, preparing the data for analysis, employing preliminary analytic methods for presenting the data, investigating and researching potential statistical models for fitting the data, fitting and

refining the appropriate model, assessing the adequacy of the model, and interpreting the results. The completed project will be presented in the form of a written report and oral presentation to the class.

**Participation:** Students will be graded on participation in class. Beyond just attendance, students will be graded on class engagement. Engagement includes peer evaluation of written work, providing feedback on oral presentations, class discussion, consulting roleplay support, and other class activities. It is anticipated that a few more than 100 points will be available to allow for one or two missed opportunities but the maximum number of points that can be earned for this component will be 100.

### Policies

Late, unexcused assignments will be penalized as follows: up to 24 hours late – 90% of grade, between 24 and 48 hours late – 75% of grade, thereafter – no credit. Excused late submissions are granted for emergencies such as a death in the family or treatment of an injury or illness at a medical facility. **Documentation is required.** It is up to the discretion of the instructor as to how excused absences are handled and circumstances are handled on a case-by-case basis.

### Tentative Course Outline and Sample Schedule:

Week of ...	Tuesday	Thursday	Assessments
Jan. 8	Introduction	Technical Writing Overview	
Jan. 15	Org. /Language: Clear & Concise	Illustrations	Elementary Draft Due
Jan. 22	Adv. Topic 1: Process Optimization	Process Optimization	Final Elem. Document Due
Jan. 29	Process Optimization -- Planning	Process Opt. -- Modeling	Advanced 1 Planning Draft Due
Feb. 5	Process Opt. -- Validation	Process Opt. -- Follow-up Exp.	Final Adv. 1 Planning Doc. Due
Feb. 12	Process Opt. -- Model Enhancement	Adv. Topic 2: Quantile Regression	Final Adv. 1 Results Doc. Due
Feb. 19	Quantile Regression	Quantile Regression Application	Advanced 2 Draft Due
Feb. 26	Adv. Topic 3: Causal Models	Causal Testing – Two groups	Final Adv. 2 Doc. Due
Mar. 5	Causal Testing -- Activity	Intro. to Stat. Consulting	
Mar. 12	The Consulting Process	Meeting Client Requirements	Adv. 3 Document Due
Mar. 19	<b>Spring Break</b>		
Mar. 26	Consulting Sessions	Proposal Writing	In-Class Client Evaluation
Apr. 2	Proposal Constraints/Assignment	Capstone Project Setup	Draft Proposal Due
Apr. 9	Proj. Framework/Limitations	Capstone Project Consultation	Proposal Document Due
Apr. 16	Capstone Project Consultation	Capstone Project Presentations	
Apr. 23	Capstone Class Presentations	Capstone Class Presentations	Capstone Report Due

### Liberal Studies for the 21st Century:

The *Liberal Studies for the 21st Century* Program at Florida State University builds an educational foundation that will enable FSU graduates to thrive intellectually and materially and to engage critically and effectively in their communities. In this way your Liberal Studies courses provide a comprehensive intellectual foundation and transformative educational experience. This course has been approved as meeting the *Liberal Studies* requirements for **Upper-Division Writing** and thus is designed to help you become a flexible and proficient writer for professional purposes.

### Upper-Division Writing Designation:

In order to fulfill FSU's Upper-Division Writing requirement, the student must earn a "C-" or higher in the course, and earn at least a "C-" average on the required writing assignments. If the student does not earn a "C-" average or better on the required writing assignments, the student will not earn an overall grade of "C-" or better in the course, no matter how well the student performs in the remaining portion of the course.

**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 System:**

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.

Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center has been provided.

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/>

**Syllabus Change Policy:**

This syllabus is a guide for the course and is subject to change with advance notice.