

**Statistics 4893W, Consultation and Communication for Statisticians**  
**Spring 2016 Section 3**  
**MW 8:15–9:30am, Vincent 206**

**Instructor**

Aaron Rendahl, Ph.D.

366 Ford Hall, School of Statistics

Office Hours: Mon 9:30–10:30am, 1:15–2:15pm, and by appointment

Office Phone: 612-625-8599

Email: rend0020@umn.edu (Preferred method of contact)

**TA**

Winston Doom, doomx014@umn.edu

Office Hours TBD

**Course Overview**

The focus of this class is to develop written and oral communication skills needed to become a professional statistician. To do this, students will work on writing clear reports and documents that help others understand what the statistical procedures mean. Statistics 4893W is a writing intensive course focused on: solving different types of problems that a statistician might encounter in real life, collaborating with other statisticians and non-statisticians to address problems and effectively communicating statistical results in a manner that non-statisticians can understand. You will have the opportunity to consult on a clinical study (Island Consulting Project), critically evaluate literature, research a related topic of your choice as the subject of your final report and make an oral presentation. In addition, we may have guest speakers from both academia and industry.

The course will primarily consist of an extensive consulting project and an independent research paper. The consulting project will include several writing assignments, including a proposal, data analysis, final report, and a 5-10 min oral presentation. The primary audience for these writing assignments will be non-statisticians. The independent research paper will be on a topic in statistics of the student's choice. It will be written for a statistical audience.

A note on differences between the sections of 4893W: You may notice that the three sections have somewhat different styles and practices. There are at least three good reasons for this. First, this section is MW only, instead of MWF, leading to different scheduling needs. Second, each instructor has his or her own strengths and weaknesses, and it would be unsuccessful if we all tried to teach in exactly the same way. Finally, a good course is always trying new things to see what works better, and with three sections, we can accelerate this process. Your feedback at the end of the course will be much appreciated in determining what to keep and what to change in the future.

**CALENDAR**

The goal in the first three weeks of the course is to get you ready to meet your clients for the first time. We'll review some basic statistical concepts and ideas, including sample size calculations and randomization schemes. What's important to happen in the first meeting? How do you accomplish that? Also, what is the Island, and can you use WebEx?

Week	Day	Weekday	Consulting Due Dates	Other Due Dates	In Class
1	20-Jan	Wed			Introduction, Island, WebEx, Consulting
1	22-Jan	Fri by 5pm			
2	25-Jan	Mon	Instructor will form teams		Consulting, Stats Review
2	27-Jan	Wed	Informal team meeting		Consulting, Stats Review
2	29-Jan	Fri by 5pm		<b>Island Activity</b>	
3	1-Feb	Mon			Consulting, Stats Review
3	3-Feb	Wed			Consulting, Stats Review
3	5-Feb	Fri by 5pm		<b>Sample Size Activity</b>	

The next few weeks are focused on responding to the clients' needs from that first meeting, in particular, writing them a detailed proposal for their work from a statistical point of view.

Week	Day	Weekday	Consulting Due Dates	Other Due Dates	In Class
4	8-Feb	Mon	<i>get info from client</i>		Prepare for Meeting
4	10-Feb	Wed	Client meeting		About Proposal/Data entry
4	12-Feb	Fri by 5pm		<b>Quiz Followup</b>	
5	15-Feb	Mon			more stats?
5	17-Feb	Wed	<b>Individual Proposal</b>		work on group proposal
5	19-Feb	Fri by 5pm	<b>Group Proposal</b>		

This week you'll finalize that proposal, and we'll start talking about the independent research report.

Week	Day	Weekday	Consulting Due Dates	Other Due Dates	In Class
6	22-Feb	Mon			About Research
6	24-Feb	Wed			Critical Lit/Writing
6	26-Feb	Fri by 5pm	<b>Proposal to client</b>	<b>Research Idea</b>	

The class splits here a little; in class we'll be preparing you to perform and write up the analysis once you get the data from the client. Outside of class, you should be making steady progress on the draft of your independent research report.

Week	Day	Weekday	Consulting Due Dates	Other Due Dates	In Class
7	29-Feb	Mon	Optional client meeting		Data analysis
7	2-Mar	Wed		<i>idea approved by</i>	Data analysis
7	4-Mar	Fri by 5pm			
8	7-Mar	Mon			Data analysis
8	9-Mar	Wed			About Reports/Writing/citations
8	11-Mar	Fri by 5pm		<b>Bibliography</b>	
9	21-Mar	Mon			About Reports/Writing/citations
9	23-Mar	Wed			About Reports/Writing/citations
9	25-Mar	Fri by 5pm		<b>Research Draft</b>	

Now you'll be working on your analysis and write-up for the client.

Week	Day	Weekday	Consulting Due Dates	Other Due Dates	In Class
10	28-Mar	Mon	<i>get data from client</i>		Discuss Analysis
10	30-Mar	Wed			Figs/tables
10	1-Apr	Fri by 5pm			
11	4-Apr	Mon	<b>Individual Analysis</b>		work on group analysis
11	6-Apr	Wed			TBD
11	8-Apr	Fri by 5pm	<b>Group Analysis</b>		
12	11-Apr	Mon		<i>draft returned</i>	About Presentations
12	13-Apr	Wed			Revising Writing
12	15-Apr	Fri by 5pm	<b>Analysis to Client</b>		

Time to wrap everything up. On the consulting side, you'll meet with your client and present the results, prepare and give a presentation for the class, and your group will write a final scientific report with the results. You'll also finish revising your individual analysis reports and independent research papers.

Week	Day	Weekday	Consulting Due Dates	Other Due Dates	In Class
13	18-Apr	Mon	Client meeting		TBD
13	20-Apr	Wed			TBD
13	22-Apr	Fri by 5pm		<b>Research Final</b>	
14	25-Apr	Mon			Presentations
14	27-Apr	Wed			Presentations
14	29-Apr	Fri by 5pm	<b>Revised Ind. Analysis</b>		
15	2-May	Mon			Presentations
15	4-May	Wed			Presentations
15	6-May	Fri by 5pm	<b>Group Final Report</b>		

## **Grading/Assignments**

The class will be graded A–F, with grades dependent upon class attendance and participation, consulting participation, and various assignments. Assignments will be evaluated on statistical knowledge, completeness, and communication of that knowledge.

To achieve a D grade in this class, all assignments must be completed satisfactorily.

These assignments are pass/fail and may be reworked if necessary.

- Island Exploration Activity
- Sample Size and Stratification Assignment
- Basic Statistics Quiz and Followup

Additionally, you must

- Participate in all class sessions. If you must miss, please email me 24 hours in advance, or as soon as possible. I will ask you to make up the session in an appropriate way. If you miss more than two sessions, I will ask you to meet with me to determine if it might be better for you to take the course another semester.
- Participate in all consulting meetings held by your group and complete reflections.
- Complete the Group Proposal and Analysis for your client (with your group).

These assignments are graded (using A+ to D), and may be reworked if D is not met. Your final grade will be determined by translating these letter grades (A+ to D) into integers (10 to 0) and rounding the weighted average.

- Individual Study Proposal (10%)
- Individual Data Analysis Draft/Revision (20%)
- Group Final Report (10%)
- Oral Presentation (20%)
- Research Report Draft/Bibliography/Revision (40%)

Rubrics will be determined ahead of time, hopefully with class input and participation. The drafts and bibliography will be graded as satisfactorily or not, with unsatisfactory resulting in the overall grade being lowered by one partial letter grade. Late assignments will be lowered by a half of a partial letter grade, except for the individual proposal and data analysis draft; as your group is depending on you to complete these on time, these will be lowered by an entire letter grade.

**Plagiarism:** I take plagiarism and academic integrity very seriously, and all work you submit as an individual must be your own work and your own words. However, as for the assignments relating to the consulting project, you'll be discussing these in groups, and so this line can be fuzzy. We will discuss this further in class when these assignments are presented. If you have any questions please ask, so you do not put yourself and possibly others in jeopardy of failing the course.

### *Important Due Dates*

*(except for Consulting project; see those later!)*

Fri Jan 29 5pm: Island activity due

Fri Feb 5 5pm: Sample Size/Stratification  
Activity due

Fri Feb 12 5pm: Quiz followup due

Fri Feb 26 5pm: Research Idea due

Fri Mar 11 5pm: Annotated Bibliography due

Fri Mar 25 5pm: Research Paper draft due

Fri Apr 22 5pm: Revised Research Paper due

**CONSULTING**

Much of the semester will be devoted to consulting with students taking a biostatistics class (6414) in Public Health. These students (called Investigators) already have an established professional career, but need to learn statistical concepts of experimentation and how to interact with statisticians. Some groups may also work with more traditional students in 6450. The Investigators will provide the research idea for your project and will collect the data for you to analyze.

Each member of your consulting team will have a different responsibility:

- One member will be the main point of communication with the Investigators. He/she will be required to consult with his/her team on any questions, and will be the main representative in meetings. He/she is also responsible for creating the data template and the final group study report for the consulting project.
- One member will be the person in charge of the research study proposal. He/she will be required to pull together the individual design papers into one cohesive report to send to the Investigators.
- One member will be the person in charge of the final data analysis report. He/she will be required to pull together the individual analyses into one cohesive report to send to the Investigators.

**Important Dates:**

Mon Jan 25: Instructor will form teams by this date

Wed Jan 27: Informal meeting with your team to select team roles and discuss communication plans, etc. within your group; verify you can successfully use WebEx.

Mon Feb 8: Receive research idea, introduction, clinical methodology and pilot data from investigators. Study proposed research question prior to first meeting.  
Communication Lead should set up first meeting.

Feb 8 to 12: First meeting with investigators to meet and greet entire collaboration team over WebEx or in person and discuss and refine research question and brainstorm potential approaches, designs, methods to meet these questions.

Wed Feb 17 8:15am: Individual Study Design Proposal due (if late, penalized a full letter grade)

Fri Feb 19 5pm: Group Proposal (by Design Lead) due to instructor

Fri Feb 26 5pm: Revised Group Proposal due to investigators

Feb 29 to Mar 4: Optional second meeting with investigators to finalize study design, data collection methods, sample size, data format template, and data analysis methods.

Mon Mar 28: Receive dataset from study from investigators

Mon Apr 4 8:15 am: Individual Data Analysis draft due (if late, penalized a full letter grade)

Fri Apr 8 5pm: Group Data Analysis (by Analysis Lead) due to instructor

Fri Apr 15 5pm: Group Data Analysis due to investigators

April 18 to 22: Final meeting with investigators to present results, answer questions, and ensure understanding. Also discuss analysis results, implications and next steps; this will constitute the Results and Discussion section for your reports.

Weeks of Apr 25 and May 2: Presentations about the Consulting Project

Fri Apr 29 5pm: Revised Individual Analysis due

Fri May 6 5pm: Group Final Report (led by Communication Lead) due

**CLASS POLICIES**

**Technology:** The course uses technology on a regular basis during both instruction and assessments. *Student difficulty with obtaining or operating the various software programs and technologies will not be acceptable as an excuse for late work.* Due to the variation in computer types and systems, the instructor may not be able to assist in trouble shooting all problems you may have.

**Email:** My goal is to respond to your email with 24 hours of receiving it M-F 8 am – 5 pm. Evening emails will be responded to the next day. I will reply to emails received over the weekend on Monday. I may use discretion to respond earlier if a need arises.

Email is one source of communication between instructors, TAs and students for this course. As such, you will be expected to check your email frequently (i.e., at least once per day). As per the University policy, “students are responsible for all information sent to them via their University assigned email account. If a student chooses to forward their University email account, he or she is responsible for all information, including attachments, sent to any other email account.”

**Attendance:** *It is essential that students attend class each day.* If you must miss, please email me 24 hours in advance, or as soon as possible. If you must miss, please email me 24 hours in advance, or as soon as possible. I will ask you to make up the session in an appropriate way. If you miss more than two sessions, I will ask you to meet with me to determine if it might be better for you to take the course another semester.

**STUDENT RESOURCES**

**Technology Support:** The University Academic and Distributing Computing Services (ADCS) offers and supports a wide range of information technology-related services, functions, and processes through their website (<http://www1.umn.edu/adcs/help>). While most support is free to the University community, selected services or extensive consulting may be offered on a fee basis.

**Writing Support:** The University Center for Writing provides free writing instruction for all University of Minnesota students at all stages of the writing process. They have an excellent reputation for helping students to improve their writing skills. For more information, or to set up an appointment, visit their website (<http://writing.umn.edu>).

**UNIVERSITY OF MINNESOTA POLICIES AND PROCEDURES**

**Diversity:** It is the University Policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact me when possible to discuss their individual needs for accommodations.

### **University Grading Standards**

- A Achievement that is outstanding relative to the level necessary to meet course requirements.
- B Achievement that is significantly above the level necessary to meet course requirements.
- C Achievement that meets the course requirements in every respect.
- D Achievement that is worthy of credit even though it fails to meet fully the course requirements.
- F Represents failure (or no credit) and signifies that the work was either completed but at a level of achievement that is not worthy of credit, or was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.
- I (Incomplete) Assigned at the discretion of the instructor when, due to extraordinary hardship, e.g., hospitalization, a student is prevented from completing the work of the course on time. In particular, an "I" will be given if the student presents evidence from a certified professional that the student is unable to complete the course. In addition, the student must have a passing grade at the time of the incomplete request in order to receive the "I". *Requires a written agreement between instructor and student.*

### **Academic Integrity:**

Although you are working on the consulting project in groups, all reports **must be your own work**, unless designated otherwise. This means the work performed must represent your ideas and not that of someone else. The words written must be your words and not someone else's. Do not copy phrasing or code from others, whether it is your teammates, your clients, websites, other classes, or academic research. Academic dishonesty will be treated very seriously. Do not put yourself *and* another student in jeopardy by cheating.

Do not hesitate to contact me if you experience any problems, need help, or have any questions or other course-related issues. You can contact me by e-mail or come to my office hours.

Academic integrity is essential to a positive teaching and learning environment. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own, can result in disciplinary action. The University Student Conduct Code defines scholastic dishonesty as follows:

***Scholastic Dishonesty.*** *Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.*

The goal of this course is to create graduates who cannot only perform statistical analyses, but also explain said analyses. Therefore, I expect any work submitted by a student to be the work of that student. If I have any reason to suspect that a student has not performed the analysis or written the words that he or she is submitting, I will file a claim with the Office of Student Conduct and Academic Integrity. Within this course, a student responsibility for scholastic dishonesty can be assigned a penalty up to and including an F for the course.