Syllabus:
Course Overview

Course description

Sampling from finite populations, simple random, stratified, systematic and cluster sampling design, ratio and regression estimates, non-sampling errors, models.

Course goals

At the end of this course, I hope that you will:

1. understand different sources of errors in surveys and that probability sampling is essential to unbiased estimation of totals and averages,
2. appreciate the role of probability sampling in the functioning of modern society,
3. know the elements of typical sampling designs (SRS, Stratified, Cluster) and why each is advantageous,
4. understand finite- and infinite-sample inference and develop the skills to make inference for population means and totals (SRS, Stratified, Cluster, Complex) based on real data,
5. know and develop the skills to execute several strategies for estimating the uncertainty in typical estimators,
6. understand how to and develop the skills to appropriately apply and interpret modern methods for estimating relationships among variables based on real data, and
7. develop professional skills, such as working in groups, creating poster presentations, and writing professional reports.

Throughout the course, weekly overview pages will give you guidance about meeting each of those goals through the activities and assignments.

Prerequisites

Stat 5301, or PUBH-BIO 6212, or equivalent. Students should be knowledgeable about and comfortable with discrete data distributions, expected values, variances, confidence intervals, and regression. Many of these topics are reviewed in Appendix A of the course textbook.

Faculty information

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About me: I really like healthcare. All parts of it. I even find it fascinating to be on the receiving end! I am most interested in figuring out what healthcare interventions work (and are safe) and for whom they work (and are safe). Fortunately, there is often lots of data relevant to these questions. However, the best way to combine or subset data to get reasonable answers to meaningful questions is not so straightforward, and is my current focus of research. Some of this data comes from sample surveys, and so the good conduct and analysis of sample surveys is very important to me. Perhaps unfortunately for you, I will probably be using a lot of healthcare examples this semester. I will try to mix it up, but please let me know if you have a good idea for another application to discuss - often students provide fantastic examples!

On a more personal note, I've been teaching here at OSU and living in Columbus since 2006. I love to walk everywhere -- in my office and in the city (you may catch me on High Street on a nice evening), as well as in the great outdoors. The photo above is a selfie on the top of Mount Cardigan from a visit to Dartmouth College. I also like to travel, and have been to 4 of the 7 continents. Can you guess which ones? When I'm not on the road, I'm curled up at home in Short North with my husband and dog.

Syllabus:
Course Materials

Textbook

Lohr, Sharon L. *Sampling: Design and Analysis*, second edition. Brooks/Cole; 2010.

- You can purchase the text in hard copy, or as an e-book. Here is the publisher's website: http://www.cengagebrain.com/shop/en/US/storefront/US?cmd=catProductDetail&showAddButton=true&productID=1575860932118715412851707107148676744 1&cid=APL1, but I am sure you are clever enough to be a smart shopper. The text is also on reserve on campus at the 18th Ave Library.
- The textbook has a website where you can download datasets: http://www.cengage.com/cgi-wadsworth/course_products_wp.pl?fid=M20b&product_isbn_issn=9780495105275

Other relevant books

- Cochran, *Sampling Techniques*
- Scheaffer, Mendenhall and Ott, *Elementary Survey Sampling*
- Kish, *Survey Sampling*
- Hansen, Hurwitz and Madow, *Sample Survey Methods and Theory*
- Groves, Fowler, Couper, et al., *Survey Methodology*

Syllabus: Technology

FOR HELP: Call **614-688-HELP** or email **8help@osu.edu** at any time for technical support.

Necessary equipment

Computer: current Mac or PC (or Linux) with high-speed internet connection and the following software installed:

- Firefox web browser (the best browser for Carmen - many other browsers work for most of the functions, though)
- Adobe Reader, or an alternative PDF reader

Recommended equipment

Webcam: built-in or external webcam, fully installed, for participating in CarmenConnect office hours

Microphone: built-in laptop or tablet mic or external microphone, for participating in CarmenConnect office hours

Digital camera: at least 5 megapixel or current smartphone camera, with the ability to upload photos to the Internet

Baseline technical skills

Basic computer and web-browsing skills

Navigating Carmen

- Carmen help from the Office of Distance Education and eLearning
- Carmen system check

Technology skills for this course

CarmenConnect text, audio, and video chat

- CarmenConnect Instructions and Help

Collaborating in Carmen Wiki

Using R software

- We will using computing for a variety of purposes, including selecting samples and analyzing survey data. In this course, we will be using the R software, which is freely available for most operating systems (http://www.r-project.org/). If you are not already familiar with R programming, there are a plethora of online tutorials available. I recommend the video tutorials by Dan Goldstein you can find here: http://www.decisionsciencenews.com/2007/09/26/r-video-tutorial-number-1/. This tutorial includes instructions about how to download and install the program.

Syllabus:
Grades and Grading Policies

Point totals

Points in the course will be distributed as follows:

Assignment	% Final Grade	Due
Participation	15%	Often
Individual Homework	10%	Weekly
Midterm Exam 1	20%	September 29-30
Midterm Exam 2	20%	October 3-4
Project	35%	Weekly from Week 6, and December 12

Late assignments

Late assignments will not be accepted. I suggest you not wait until the very last minute in case you ahve technical difficulties. However, yur lowest homework grade will be deducted from the final homework average.

Grading scale

Your final course grade will be based on the percentage earned, according to the standard OSU grading scheme:

Percentage	Letter Grade
93-100%	A
90-92%	A-
87-89%	B+
83-86%	B
80-82%	B-
77-79%	C+
73-76%	C
70-72%	C-
67-69%	D+
60-66%	D
Less than 60%	E

To see your grades at any time during the course, click **Grades** in the navigation bar.

Faculty response time

I am providing the following list to give you an idea of my intended availability throughout the course.

(Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

GRADING AND FEEDBACK

For homework assignments, you can generally expect feedback within 5 week days. For group project assignments, you can generally expect feedback within 2 week days.

E-MAIL

I will generally reply to e-mails within 24 hours.

DISCUSSION BOARD

I will generally check and reply to messages in the discussion boards every 36 hours.

Syllabus:
Participation and Communication

Participation requirements

Because this is an distance-education course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **Participating in discussion forums**: 4+ TIMES PER WEEK

As participation, each week you can expect to post at least four times as part of our substantive class discussion on the week's activities and topics. Instructions for this participation will be given in the course content for that week. See the grading rubric for discussion posts, which are part of your final grade. Each week's participation is weighted almost equally. No participation grades are "dropped" from the final grade calculation.

- **Office hours and live sessions**: OPTIONAL OR FLEXIBLE

  All live, scheduled events for the course, including my office hours, are optional. For live presentations, I will provide a recording that you can watch later. If you are required to discuss an assignment with me, please contact me if you need a time outside my scheduled office hours.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful. See the OSU Online guidelines for online discussions for more information.

- **Writing style**: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.
- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe--and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work**: Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

Syllabus:
Individual Homework

Individual homework assignments will be due weekly (exact dates noted on Carmen) and consist of a small number of exercises, short answer questions, and short data analyses. The length of these assignments will be inversely related to the weekly requirements for the class project, as described in the project section of Carmen. Each assignment is weighted equally, regardless of length.

You should submit your homework via the provided Carmen dropboxes by 5:00pm on the due date. Submissions should be in .pdf format. NO late homework will be accepted.

While the main purpose of homework is to be sure you understand the concepts and practice the techniques, homework will also be graded. It is your job to make your homework easy to grade. Raw computer output is unacceptable; all computer output must be edited and annotated. Graphs and plots must be clearly labeled and discussed in the text of the homework. Problems that are out of order or with parts not clearly identified may not receive full credit.

Homework you submit should be your own and should demonstrate your personal understanding of the problems, although I encourage you to work together in solving the problems. Feel free to ask me for help after you have made an attempt to solve the problems.

Syllabus: Exams

There will be two exams for this course. Both are closed book and closed notes. You may use a single 8.5 x 11in sheet of notes for the first exam and two sheets of notes for the second exam. You may also use a calculator, but no use of cell phones or other communication devices will be allowed. Each exam must be completed during a one-hour period within the dates noted below. For each exam, one on-campus exam period will be proctored by the instructor.

Alternatively, students may take their exams remotely at a pre-approved proctoring site. The Ohio State University (OSU) Testing Center (http://registrar.osu.edu/testing/) is an acceptable proctoring site, and offers appointments Monday-Friday 8am – 5pm. Most other institutions (e.g., Columbus State Community College or Franklin University) also offer proctoring for a fee. Students must pre-arrange proctoring site testing with both the instructor and proctoring site at least three weeks before the first available exam time.

	Midterm Exam 1	**Midterm Exam 2**
Exam Dates	September 29-30	November 3-4
On Campus Proctoring	September 29 5:00-6:00pm	November 3 5:00-6:00pm
Remote Arrangement Deadline	September 8	October 13

Syllabus: Project

Overview

To solidify the concepts covered in class, you (as part of a small group) will design and conduct a high quality survey, analyze the resulting data in a statistically sound manner, and present your results via a virtual poster and a written report.

I am asking you to complete this project in small groups for several reasons. First, and perhaps least important, the project is too large for an individual to complete on their own. Second, I hope that you will learn from each other as you discuss various choices you must make to complete the project. Third, statistics doesn't happen in a vacuum. Working as a part of a team is an essential skill that this project will help you develop. Fourth, the broad array of learning and retention benefits that result from collaborative work is well documented. If you want to discuss the pedagogy of group-based education, I would be happy to!

You are free to divvy up the project work in any way your group would like to, with the exception that all members must be involved in developing the project sampling plan and analyzing the data, and all members must read and approve the final report before submission. (Details of these parts car in the Project section of the Content area in Carmen.) That is, all members of the group must be involved in the project in some way from start to finish. If you would like assistance with any aspect of your project, please contact the instructor via email to set up a meeting.

I realize that working as part of a group may not come naturally to many of you, especially in a distance education course. Here are some resources that you might find helpful:

- Group Skills Development Pledge, by Middendorf and Dormant.
- Working in Groups: A Note to Faculty and a Quick Guide for Students, by Ellen Sarkisian
- Tips for Participating in Group Work Online (from WPI - obviously the "myWPI Virtual Classroom" is not available to you.)

Communication

Once groups are assigned in the first week of class, I will provide a private Carmen Discussion board for each group to use to communicate. In addition, you are welcome to use CarmenConnect. However, feel free to communicate by any means that the group decides is most effective.

Weekly Progress Reports

To keep you on track in your project development, beginning in the sixth week of the course, you must submit progress reports.

- Due Dates: Reports are due by **5:00 pm** on the due date (typically Monday).
- Submission: Reports should be electronically submitted to the corresponding Carmen drop-box. Only one report should be submitted per group.
- Format: Reports must be in .pdf format. MS Word documents do not retain their formatting across platforms, and so I may not be able to read what you had intended in a Word document. If you need help creating .pdf documents, please contact me.
- More format: Each progress report should include the names of all the project participants at the top of the first page.
- Content: The information I expect to be in these reports (and resulting expectations regarding the overall project) is described in detail in each assignment in the project section of the Content area on Carmen.
- Resubmission: Because each of these steps must be completed for a successful project, you will be asked to resubmit any unacceptable progress reports. The due date of a resubmission will be communicated at the time of the request. The grade received for that report may be affected by the resubmission.

Assessment

The project comprises 35% of your final grade. The interim reports will make up a total of 10%, the poster presentation in week 14 will make up 5%, and the final report will make up the remaining 20% of your final grade.

Syllabus:
Academic Integrity

Integrity in this online course

Exams. You must complete the midterm exams yourself, without any external help or communication.

Written assignments. Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should formally cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.

Reusing past work. In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.

Falsifying research or results. All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your research look more successful than it was. The course evaluation emphasizes the methodological choices over the actual results.

Collaboration and informal peer-review. The course includes many opportunities for formal collaboration with your classmates. Study groups and peer-review are encouraged, but you should only turn in work that is yours. If you're unsure about a particular situation, please feel free just to ask ahead of time.

Group projects. This course includes group projects, which can be stressful for students when it comes to dividing work, taking credit, and receiving grades and feedback. I have attempted to make the guidelines for group work as clear as possible for each activity and assignment, but please let me know if your group is struggling.

Ohio State's academic integrity policy

Cheating, plagiarism and other forms of academic dishonesty will not be tolerated. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. The instructor will report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct: http://studentlife.osu.edu/csc/.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)*

Syllabus:
Accessibility and Support

Requesting accommodations

Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. In addition, please contact the Office for Disability Services to register any documented disabilities. Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and

should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.osu.edu/.

More resources regarding accessibility can be found here: http://ada.osu.edu/resources/Links.htm.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Desire2Learn) accessibility
- Streaming audio and video
- Synchronous course tools

Academic and Student Support

The University provides resources and services for academic and student support. More information about these resources is here: http://artsandsciences.osu.edu/current-students/university-resources and here: http://ssc.osu.edu.