

**Statistics 6510**  
**Survey Sampling Methods**  
**Autumn 2014**

- Description:** Sampling from finite populations, simple random, stratified, systematic and cluster sampling design, ratio and regression estimates, non-sampling errors, models.
- Goals:** At the end of this course, students will understand how sample surveys are conducted, why common survey designs are used and when each is most appropriate, be able to analyze the results of surveys that use common designs, and be able to derive from first principles the standard results and their generalizations.
- Instructor:** Dr. Elly Kaizar  
221 Cockins Hall  
614-247-2585  
ekaizar@stat.osu.edu
- TA:** TBD
- Website:** The course will utilize the Carmen system, which you can access here: <http://carmen.osu.edu>. If you need help accessing or using elements of the Carmen system, please seek help here: <https://carmen-services.it.ohio-state.edu/carmen-help/students/>, here: <https://ocio.osu.edu/elearning/services/tools/carmenconnect/participants/>, or by contacting 8-help by telephoning 614-688-4357 (TDD: 614-688-8743) or e-mailing [8help@osu.edu](mailto:8help@osu.edu).
- Office Hours:** One pre-scheduled synchronous online office hour per week, and by appointment. Office hours will be held via Carmen Connect. You can learn about how to connect to and participate in the office hour here: <https://ocio.osu.edu/elearning/services/tools/carmenconnect/participants/>. The link for participation is posted on the course website. I also encourage you to email me about questions and computing problems.
- Time/Place:** Approximately 2 hours of video instruction to be viewed each week, and approximately 1 hour of asynchronous interactive online activities and discussion. All asynchronous activities will be accessible via the course website.
- Text:** *Sampling: Design and Analysis*, Lohr SL, second edition.  
The textbook has a website where you can download datasets:  
[www.wadsworth.com/cgi-wadsworth/course\\_products\\_wp.pl?fid=M20b&product\\_isbn\\_issn=9780495105275](http://www.wadsworth.com/cgi-wadsworth/course_products_wp.pl?fid=M20b&product_isbn_issn=9780495105275)

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

**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 Lohr.

**Computing:** We will use computing for a variety of purposes, including selecting samples and analyzing survey data. In this course, we will be using R software, which is freely available for most operating systems. 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.

<b>Tentative Schedule:</b>	<b>Week</b>	<b>Topic</b>	<b>Text Reading</b>
	Week 1	Overview, introduction to sampling, and introduction to R	1.1-1.3, 1.6
	Week 2	Nonsampling error and statistics review	1.4-1.5
	Week 3	Simple random sampling	2.1-2.6, 2.8, 2.10
	Week 4	Stratified random sampling	3.1-3.5
	Week 5	Ratio/regression estimation	4.1-4.5
	Week 6	Cluster sampling	5.1-5.5
	Week 7	Sampling with unequal probabilities	6.1-6.6
	Week 8	Complex surveys	7.1-7.6
	Week 9	Models for survey sampling	2.8, 3.6, 4.6, 5.6, 6.7
	Week 10	Variance estimation	9.1-9.5
	Week 11	Regression inference	11.1-11.5, 11.7
	Week 12	Categorical data analysis	10.1-10.3, 11.6
	Week 13	Nonresponse	8.1-8.8
	Week 14	Special Topics, such as randomized response, small area estimation, or multiple frame sampling	15.4, 14.2, 12.1

<b>Evaluation:</b>	Individual Homework	10%
	Participation	15%
	Exam 1	20%
	Exam 2	20%
	Project	35%

Grades will be kept on Carmen. The standard OSU grading scale will be used.

**Individual Homework:**

Individual homework assignments will be due weekly (exact dates noted on the course website) 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 accompanying project document. 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. Instead, your lowest homework grade will be dropped from the final homework average.

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.

**Exams:**

There will be two exams for this course. Both are closed book and closed notes. You may bring a single 8.5 x 11in sheet of notes to the first exam and two sheets of notes to the second exam. You should also bring a calculator to the exam, 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. Students wishing to take advantage of this option should contact the instructor to make individual arrangements **by September 15**. Remote exams must have proctors that are pre-approved by the instructor. Acceptable proctors include employers, supervisors, teachers, and librarians. Ordinarily, A letter verifying the proctor's position must be provided by the proctor's supervisor on appropriate letterhead. Exams completed remotely will be administered as follows. The exam questions will be able to be viewed as a "quiz" on the Carmen website for a total period of one hour. Students should answer the questions by hand on paper. At the end of the hour, the proctor should sign each page of the student's work, and submit the exam through one of these methods:

- deliver the exam papers to the instructor via a method such that they are received within 72 hours of the end of the exam period (e.g. US priority mail),
- scan the exam papers into a .pdf format and email them to the instructor after checking that the images are legible, or
- photograph the exam papers and email them to the instructor after checking that the images are legible.

<b>Exam</b>	<b>Exam Dates</b>	<b>On Campus Proctoring</b>
Exam 1	Sept. 29 - 30	Monday, Sept. 29, 4:00 - 5:00 pm
Exam 2	Nov. 3 - 4	Monday, Nov. 3, 4:00 - 5:00 pm

**Project:** Students will be assigned to small groups in which to work on projects. Points earned on a project will be shared equally for each member of the group. Project requirements and evaluation are described in the separate Project Guidelines document.

**Participation:** Students are required to participate in the asynchronous online activities and discussion. Each week, the instructor will post a set of questions for discussion related to the online content, homework, or projects. Each student must post at least one relevant comment each week. At 5:00 pm on the Monday of the relevant week, participation will be checked on a pass/fail basis. One point is awarded for each pass. The timing and grades for participation in the virtual poster session are different from this scheme, as described in the separate Project Guidelines document, and noted on the schedule on Carmen.

**Academic Integrity:** 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 instructors 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/>.

**Disability  
Statement:**

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>.

**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>.

**Disclaimer**

This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular I reserve the right to change due dates or the methods of assessment. Official announcements will ALWAYS be those posted on the course website.