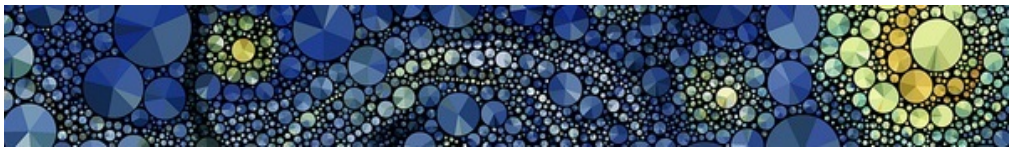
Course Syllabus

Jump to Today



Outline

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A. Course overview

Course description

Analysis of discrete data, including 2x2 tables; cross-sectional, prospective, and retrospective studies; measures and tests of association; log linear models; association graphs; and analysis of stratified tables.

Course goals

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

1. Appreciate the pervasiveness of discrete data in science and society.
2. Understand the properties of and develop the skills to conduct standard univariate inference about the parameters for typical discrete distributions (Poisson, Bernoulli, Binomial, Multinomial.)
3. Develop the skills to conduct standard inference about typical measures of association between two (or more) discrete variables.
4. Understand the difference between experiments and observational studies (cohort or case-control) and how to appropriately interpret the results of these studies.
5. Develop the skills to model associations among discrete random variables via log-linear and logistic models, including assessment of model fit.
6. Understand the special statistical issues with matched pair study designs, and

develop the skills to appropriately make inference using such data.

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

Prerequisites

STAT 5302 (530), STAT 6450 (645), STAT 6950, PUBHBIO 6203, PUBHBIO 703, or permission of instructor. Not open to students with credit for STAT 665. Essentially, you should be familiar with basic concepts of probability and inference, as well as comfortable with analysis of variance (ANOVA) and linear regression.

Course Schedule and Location

We will meet every Tuesday and Thursday from 12:40 to 2:30pm in McPherson Lab room 2019. This is a first term course, so the course runs from January 11 through February 25. However, I will be traveling on February 25, and so I will be holding a **regular class period on March 1.**

Faculty information

Name: **Elly Kaizar**

Email address: **kaizar.1@osu.edu**

Phone number: **614-247-2585**

Web site: www.stat.osu.edu/~ekaizar (http://www.stat.osu.edu/~ekaizar)

Office: **221 Cockins Hall**

Office Hours: **Friday, 1:50-2:45pm, and by appointment.** I also encourage you to ask short questions via email.

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. Many of these applications - especially the safety ones - involve categorical variables, and so discrete data analysis is something I think about almost every day. Perhaps unfortunately for you, I will probably be using a lot of

healthcare examples this semester. I will try to mix it up, so please let me know of any idea you might have 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 (http://en.wikipedia.org/wiki/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.

B. Course materials

Textbook

Alan Agresti (2007) *An Introduction to Categorical Data Analysis, Second Edition*. Wiley. (http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP000369.html)

You can also read this online (one at a time) via the e-book at the OSU library. Here's a link to the worldcat summary page: http://osu.worldcat.org/title/introduction-to-categorical-data-analysis/oclc/368083243?ht=edition (http://osu.worldcat.org/title/introduction-to-categorical-data-analysis/oclc/368083243?ht=edition) , and here's a direct link to the e-book that should work from computers on campus: http://site.ebrary.com/lib/ohiostate/docDetail.action?docID=10278250 (http://site.ebrary.com/lib/ohiostate/docDetail.action?docID=10278250)

This text is affectionately known as 'Little Agresti.' It is essentially a subset of the much more substantive 'Big Agresti,' aka Categorical Data Analysis (http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470463635.html) . Make sure you are looking at the 'Little' one for assignments.

Supplemental reading assignments will be posted on Carmen.

Other references

While not required, you might find the following references useful:

- Agresti (2002) Categorical Data Analysis, Second Edition.
- Bishop, Fienberg & Holland (1975) Discrete Multivariate Analysis.
- Christensen (1994) Log-Linear Models.
- Fienberg (2007) The Analysis of Cross-Classified Categorical Data, 2nd edition.
- Hosmer & Lemeshow (2013) Applied Logistic Regression, 3rd edition.
- Santner & Duffy (1989) The Statistical Analysis of Discrete Data.

C. Technology

Course website

All information regarding this course will be posted to the Carmen Canvas Pilot (https://osu2.instructure.com/) . However, all announcements in class supersede previous Carmen posts.

Necessary equipment

Access to current computer running a Windows, OSX, or Linux operating system and with reasonable internet connectivity via a modern browser.

Computing

We will using computing for a variety of purposes, including simulating and analyzing discrete data. In this course, we will be using the R software, which is freely available for most operating systems (http://www.r-project.org/). R is a programming language used by many statisticians and related scientists that requires you to write code directly. If you are not already familiar with R programming, there are a plethora of online tutorials available. I recommend the Swirl tutorial package. Instructions for using Swirl are available here: http://swirlstats.com/students.html (http://swirlstats.com/students.html) . I recommend trying out most of the lessons in the 'R Programming' tutorial module that Swirl will automatically load for you. I will be providing lots of sample R code, so even beginning R users should be able to complete assignments.

If you are using a computer that does not already have R installed, please install it by following the steps noted on the Swirl (http://swirlstats.com/students.html) page.

D. Assignments and grading

While not explicitly graded, students are expected to complete the appropriate textbook reading prior to attending the relevant class. Please refer to the course modules and calendar for the reading assignments and keep up to date with them.

The graded activities of this term course will consist of 5 graded homework assignments, one 110-minute midterm exam, and one take-home final exam.

Due Dates and Final Grade Calculation

Activity	Due Date	% Final Grade
Homework 1	January 19	5%
Homework 2	January 26	5%

Homework 3	February 2	5%
Homework 4	February 9	5%
Midterm Exam	February 16	35%
Homework 5	February 23	5%
Final Exam	March 1	40%

Grading scale

The grades in this class will be calculated according to the OSU standard grading scale.

Homework logistics

Homework assignments are due at **12:01 pm** on their due date. Late homework will not be accepted, except for extraordinary circumstances. Please contact the instructor as soon as possible if a situation arises where you may be prevented from submitting your homework on time.

All homework must be uploaded to the appropriate place on the Carmen Canvas Pilot. (https://osu2.instructure.com/) No paper homework will be accepted. To be complete and acceptable, each homework submission **must**:

1. Contain your name both **inside** the file and as **part of the file name**.
2. Be a **single** .pdf file
3. Be in the same order as the assignment (typically numerical order).

You do not need to typeset your homework submission. You may scan your handwritten work, or take **clear, legible** photos of your written work, and then combine these into a single .pdf file. Here's instructions from a previous TA on how to accomplish this via MS Word:

- To insert a picture of your handwritten homework into a Word file:

1. Open a Word file.
2. Click Insert where you would like the picture to go.
3. Click Picture.
4. Choose your homework picture. The picture of your homework should become a part of the Word document you have just created.
5. Arrange the pictures in the right order in the Word file. (This **does** need to be legible, but does **not** need to be beautiful.)

- To save your Word file as a .pdf file:

1. Click File.
2. Choose Save as.
3. Click on the box "Save as type" (Windows) or "Format" (Mac). A menu of types of files should be shown.
4. Choose pdf.

You may discuss all homework assignments with your classmates, but the work you submit should be your own.

Midterm exam logistics

The midterm exam will take place during class. You may bring a calculator, and a single regularly-sized sheet of paper (approximatly 8.5x11 inches) with notes of any kind on both sides of the sheet. Of course, no cell phones or tablets will be allowed. You may not discuss your exam with your classmates during the exam time.

Final exam logistics

The final exam will be released via Carmen. You must upload your final exam submission to Carmen by 12:01 pm the due date. Specific instructions for the submission will be included in the exam instructions. You may use resources such as your textbook, but you **may not discuss any aspect of the exam with anyone other than the instructor (either in person or electronicaly) until the due date has passed**. I will take any case of suspected cheating (including such communication) to the Committee on Academic Misconduct, as described below.

E. Participation and communication

All students are expected to attend and participate during the scheduled class sessions, Tuesdays and Thursdays, 12:40 - 2:30pm. In addition, I will open discussion boards within the Carmen Canvas Pilot. In all this communication, I expect you to be respectful and part of creating a supportive learning community.

F. 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/ (http://www.ods.osu.edu/) .

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

Accessibility of course technology

This course requires use of Carmen (Ohio State's learning management system). Information about Carmen (Desire2Learn) accessibility can be found here: http://www.desire2learn.com/products/accessibility/ (http://www.desire2learn.com/products/accessibility/) . If you need additional services to use these technologies, please request accommodations with your instructor.

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 (http://artsandsciences.osu.edu/current-students/university-resources) and here: http://ssc.osu.edu (http://ssc.osu.edu) .

G. Academic integrity

Academic integrity in this course

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

Written homework assignments. Your written assignments should be your own original work. You should formally cite the ideas and words of your research sources, including direct quotes from the textbook. 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 the instructor.

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 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 just ask Dr. Kaizar ahead of the due date.

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/ (http://studentlife.osu.edu/csc/) .

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

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

- The Committee on Academic Misconduct web pages (COAM Home (http://oaa.osu.edu/coam.html))
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions (http://oaa.osu.edu/coamtensuggestions.html))*

Date	Details	
Fri Jan 15, 2016	Office Hours (https://osu2.instructure.com/calendar?event_id=208&include_contexts=course_24)	1:50pm to 2:45pm
Thu Jan 21, 2016	**Homework 1 (https://osu2.instructure.com/courses/24/assignments/185)**	due by 12:01pm
Fri Jan 22, 2016	Office Hours (https://osu2.instructure.com/calendar?event_id=209&include_contexts=course_24)	1:50pm to 2:45pm
Thu Jan 28, 2016	**Homework 2**	due by

	(https://osu2.instructure.com/courses/24/assignments/186)	12:01pm
Fri Jan 29, 2016	Office Hours (https://osu2.instructure.com/calendar?event_id=210&include_contexts=course_24)	1:50pm to 2:45pm
Thu Feb 4, 2016	**Homework 3 (https://osu2.instructure.com/courses/24/assignments/187)**	due by 12:01pm
Fri Feb 5, 2016	Office Hours (https://osu2.instructure.com/calendar?event_id=211&include_contexts=course_24)	1:50pm to 2:45pm
Thu Feb 11, 2016	**Homework 4 (https://osu2.instructure.com/courses/24/assignments/188)**	due by 12:01pm
Fri Feb 12, 2016	Office Hours (https://osu2.instructure.com/calendar?event_id=212&include_contexts=course_24)	1:50pm to 2:45pm
Tue Feb 16, 2016	**Midterm Exam (https://osu2.instructure.com/courses/24/assignments/191)**	due by 2:30pm
Fri Feb 19, 2016	Office Hours (https://osu2.instructure.com/calendar?event_id=213&include_contexts=course_24)	1:50pm to 2:45pm
Tue Feb 23, 2016	**Homework 5 (https://osu2.instructure.com/courses/24/assignments/189)**	due by 12:01pm
Fri Feb 26, 2016	CANCELLED: Office Hours (https://osu2.instructure.com/calendar?event_id=431&include_contexts=course_24)	1:50pm to 2:45pm
Tue Mar 1, 2016	**Final Exam (https://osu2.instructure.com/courses/24/assignments/192)**	due by 12:01pm