Statistics 5301
Intermediate Data Analysis I
Autumn Semester 2018
The Ohio State University

Class Meetings: Caldwell Labs, Room 120, Tu/Th, 8:00am – 9:50pm
Instructor: Nicole Kelbick, PhD
Contact: (614)-292-0293, kelbick.1@osu.edu
Office Hours: 304-A Cockins Hall (CH), **Wednesdays 9:30pm-11am and 1:30pm-3pm** or by appointment

Grader:

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Prerequisites: Prerequisites: Math 1075 (104) or equivalent, or Math Placement Level of R, or permission of instructor.

Enrollment: ADD and SECTION CHANGES will be processed daily, contingent upon availability, from 7:30am – 4:30pm starting on Tuesday January, 17th through end of the week. This will be on a first-come first-served basis in 408A Cockins Hall. **The instructor does not sign any Add or Section Change forms.** Check out https://stat.osu.edu/undergraduates/academic-programs/course-enrollment for more detailed information regarding Add and Section Changes.

Closed Section Strategy: If the section you wish to take is closed, consider enrolling into another section that is still open. It is much easier to do a section change (and there are no late add fees either) if a space opens up. It is more complicated to do a late enrollment and the chance of succeeding is not great.

Textbooks:
(1) *Introduction to the Practice of Statistics* (8th edition) by David S. Moore, George P. McCabe, and Bruce A. Craig.

Although this text is NOT required it is highly recommended (current or previous versions) and can be used as a reference for the first half of the course. Chapters 1 – 8 of the book are reviewed in this course.   Topics include Looking at Data (distributions, relationships – two-way tables – scatterplots - simple linear regression, producing data), Probability, Sampling Distributions, Inference for Means and Proportions (one-sample and two sample z-tests and t-tests), ANOVA.

(2) *The Statistical Sleuth: A Course in Methods of Data Analysis* (3rd edition) by F. L. Ramsey and D. W. Shafer.

This text is used for the second half of the course and is also used in STAT 5302, the second course in the Intermediate Data Analysis sequence. Chapters 1 – 6 will be covered for this course; they encompass topics in Drawing Statistical Conclusions, Inference Using t-Distributions, A Closer Look at Assumptions, Alternatives to t-Tools

(Nonparametric tests), Comparisons Among Several Samples (ANOVA), and Linear Combinations and Multiple Comparisons of Means.

The textbooks are on reserve in the 18th Ave and Thompson's libraries.

Website: The course has a web page on Carmen (http://www.carmen.osu.edu). Homework assignments, solutions, class schedule, and other relevant material and announcements will be posted on Carmen. Please check it on regular basis.

Course Description: Stat 5301 is the first course in a two-semester non-calculus sequence in data analysis covering descriptive statistics, design of experiments, probability, statistical inference (one-sample and two-sample problems, goodness of fit, and one-way ANOVA). This course satisfies the General Education (GE) requirement in Data Analysis.

Goals: Develop the skills to draw sound statistical conclusions by critically evaluating data-based results.

Expected Learning Outcome:
- Understand basic concepts of statistics and probability
- Comprehend methods needed to analyze and critically evaluate statistical arguments
- Recognize the importance of statistical ideas.

Students in Statistics 5301 are expected to be able to identify an appropriate analysis for data collected in a study, carry out such an analysis, examine whether the assumptions behind the analysis are reasonable, and recognize the strengths or weaknesses of the study based on how the data were collected.

Doing so requires understanding basic concepts in statistics and probability; the ability to create graphical and numerical summaries of data; understanding how the design of a study affects the conclusions that can be made; and the ability to carry out basic statistical analyses (by hand or using statistical software). Students will conduct analyses of data, including a discussion (in plain English) of what conclusions can be drawn.

Important Dates:

Weekday(s)	Date	Reason
Monday	September 3rd	Labor Day (no classes)
Friday	September 14th	Last day to drop a course
Thursday	**September 27th**	**Midterm I**
Thursday/Friday	October 11th-12th	Autumn Break (no classes)
Friday	October 26th	Last day to withdraw without petitioning
Thursday	**November 1st**	**Midterm II**
Monday	November 12th	Veteran's Day (no classes)
Weds/Thurs/Friday	November 21st-23rd	Thanksgiving Break (no classes)
Wednesday	December 5th	Last day of classes
Tuesday	**December 11th**	**Final at 8:00-9:45am**

Grading: Your grade will be based on homework assignments, two midterms, and a final exam (not comprehensive but may include some material covered from Midterm II). The relative point-worth of these components are as follows:

Homework	15%
Midterm I	25%
Midterm II	30%
Final	30%
	100%

Exams: All exams will be closed book and closed notes. The final exam will emphasize new material but some prior material will still be fair game if used in the current material (e.g. use of normal distributions). **For the first midterm** you are allowed to bring one standard size (8.5 × 11 inch) sheet containing formulae. **For the second midterm** you are allowed one new formula sheet as well as the one from the 1st midterm. **For the final exam**, you are allowed one new formula sheet standard sized (8.5 × 11 inch) as well as the formula sheets from the first two midterms.

NOTE: I am not going to require a specific calculator for exams. HOWEVER, you will be expected to show your work and only partial credit will be given for correct answers that do not. Exam rules will be announced in class. I like to avoid makeup exams as much as possible. If there is a potential for a conflict, please contact me WELL IN ADVANCE. If you are sick, oversleep or something else occurs at the last minute, the weight of that misterm will be distributed to the final. For example, if you miss one of the first two midterms, the final will be weighted as 55% of your final grade.

Homework: There will be assignments every 7-10 days. Homework problems and solutions will be posted on Carmen. Theses homework assignments are there for you to work through in preparation for your exams. You will not learn by copying solutions from other sources. LEARN BY DOING!

Computing: You will be required to do some basic statistical analyses on the computer using the statistical software package R for your assignments.

1. Download and install R for free from https://www.r-project.org/.
    a. Select CRAN under Download
    b. Scroll down to USA
    c. Select the site closest to Columbus (Case Western Reserve University)
    d. Select the package appropriate to your operating system
    e. Select "install R for the first time"

2. Download and install R Studio for free from https://www.rstudio.com.
    a. This software provides a more user-friendly interface to R.
    b. Select Download under RStudio.
    c. Select Download under FREE.

3. **NOTE**: **INSTALL R FIRST**, **THEN RStudio.**

Office Hours: While questions are welcome during class sessions, all students should feel free to visit during office hours for individual assistance with the course material. Questions regarding grades or scores will only be answered during office hours. Students unable to attend office hours may schedule an appointment to see the instructor at another time.

Email Correspondence: In order to protect your privacy all email correspondence must be done through a valid OSU name.# account; any email from a non-osu.edu account will be ignored. Please make sure to include "STAT 5301" in the subject line. You may also contact me through Carmen. Please allow up to 48 hours for responses to other inquiries made via email. In addition, I will not respond to questions which can be answered by looking at the syllabus or Carmen, by a quick search on osu.edu or Google, and/or were announced in class. Some questions may be presented on the discussion board at the discretion of the instructor.

Communication Devices: Cell phones, PDAs and other communication devices must be either turned off or put on vibrate during class. **Please refrain from texting (and web-surfing) during class as a courtesy to those sitting around you.** If such behavior continues after being warned, your instructor reserves the right to hold onto the device until the end of class, where it will then be returned to the student. **Laptops may be used for note taking or running R code during class.**

Academic Misconduct: Although you are encouraged to work together, you are expected to produce independent work for homework and exams. Academic misconduct for any sort will not be tolerated. If students are caught indulging in dishonest activities during exams, they will be reported immediately, without any exception. Please review OSU's policies at http://studentaffairs.osu.edu/csc/.

Special Accommodation: Students with ADA-documented physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations. Veterans may also be eligible for services. All accommodations are coordinated through the Office of Disability Services (ODS) in Room 150 of Pomerene Hall, (614) 292-3307. Please contact the ODS as early in the semester as possible. You can also contact the instructor privately to discuss your specific needs.

Disclaimer: The schedule and procedures contained in this syllabus should be taken as a fairly reliable guide for the course content and policies. They are, however, subject to change at the instructor's discretion. Any changes will be announced in class as well as posted on Canvas.