

**Statistics 5301  
Intermediate Data Analysis I  
Spring Semester 2020  
The Ohio State University**

**Instructor:** Nicole Kelbick, PhD  
**Contact:** kelbick.1@osu.edu  
**Office Hours:**     **304-A Cockins Hall (CH)**  
                          **Tuesday: 2:15pm - 4:00pm**  
                          **Wednesday: 1:00pm – 3:30pm**

**Grader:** Vilizar Goshev, goshev.1@osu.edu

**Class Meetings:**

<b>Class</b>	<b>Monday/Wednesday</b>
<b>Number</b>	20269 (Undergraduate) 20270 (Graduate)
<b>Location</b>	Room 240 in <b>Cockins Hall</b>
<b>Time</b>	8:00am-9:50am

**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 Monday January, 13<sup>th</sup> through end of the week. This will be on a first-come first-serve basis in 408A Cockins Hall. **The instructor does not sign any Add or Section Change forms.** Students cannot be added to courses if there is a hold on their record, adding this class will cause their total semester hours to exceed 18 credit hours or the prerequisites are not met. 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 18<sup>th</sup> 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.

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**Goals:** Students develop skills in drawing conclusions and critically evaluating results based on data. **Expected Learning Outcomes:** Students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and 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	January 20 <sup>th</sup>	MLK Day (no classes)
Monday-Friday	March 9 <sup>th</sup> -13 <sup>th</sup>	Spring Break (no classes)
Monday	April 20 <sup>th</sup>	Last day of classes

Class	Monday/Wednesday
Exam 1	February 19 <sup>th</sup> (Wednesday in class)
Exam 2	March 25 <sup>th</sup> (Wednesday in class)
Final	April 23 <sup>rd</sup> at 8:00am (Thursday in class)

**Grading:** Your grade will be based on homework assignments, two midterms, and a final exam (may or may not be comprehensive). The relative point-worth of these components are as follows:

Homework	20%
Midterm I	25%
Midterm II	25%
Final	30%
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	100%

**Homework:** There will be approximately weekly assignments. Homework problems and solutions will be posted on Carmen.

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

1. Download R for free from <https://www.r-project.org/>.
2. Install R.
3. Download R Studio, a more user-friendly interface, from <https://www.rstudio.com>.
4. Install R Studio
5. See Carmen for more detailed instructions.
6. **NOTE: INSTALL R FIRST, THEN RStudio.**

**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 1<sup>st</sup> 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 midterm 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.

**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.

**Communication Devices:** Cell phones, PDAs and other communication devices must be either turned off or put on vibrate during class. Please refrain from texting during class as a courtesy to those sitting around you. All electronic devices other than a calculator must be shut off and put away during examinations.

**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.