



SYLLABUS

ENR 2000

Natural Resources Data Analysis
Spring 2019

COURSE OVERVIEW

Instructor: Bryce Adams, PhD

Email: adams.861@osu.edu

Office: 375D Kottman Hall

Office hours: Tuesdays and Thursdays 1:00-2:00 PM, or by appointment

Teaching Assistant: Annalee Tutterow

Email: tutterow.2@buckeyemail.osu.edu

Office: 382 Kottman Hall

Office hours: Monday 12:00-1:00 PM, and Wednesday 3:30-4:30 PM

Two other class members: _____

Lecture: Tuesdays and Thursdays 3:00-3:55 PM; Ag. Admin. Bldg. #108

Lab: Monday 3:45-5:45 PM, Kottman Hall #114

Thursday 4:00-6:00 PM, Kottman Hall #114

Course description: This is an introductory data analysis course that will focus on understanding and applying basic statistical concepts, problem solving, interpreting and presenting the results of statistical analyses. Topics include descriptive statistics, variability, correlation, regression, probability, the normal distribution, samples, sampling distributions, confidence intervals, hypothesis testing, analysis of variance (ANOVA), Chi-square tests, and interpretation of findings. We will also cover the presentation of findings and use statistical software programs. The overall goal is to obtain a working knowledge of statistics, data analysis procedures, and exposure to using Excel and R that will be useful in understanding academic and other literature, preparing for advanced statistics courses, and involvement in research.

Course description: By the end of class, students should successfully be able to:

- understand basic statistical concepts and terminology
- solve problems by applying the appropriate statistical concepts and methods
- interpret and communicate the results of statistical analyses
- gain a greater appreciation for statistics and data analysis
- learn statistical software programs for data analysis (R and excel)

COURSE MATERIALS AND TECHNOLOGIES

This course meets a General Education requirement in Data Analysis.

According to the OSU guidelines:

“Courses in Data Analysis develop students’ understanding of basic concepts of statistics and probability, comprehension of methods needed to analyze and critically evaluate statistical arguments, and recognition of the importance of statistical ideas. Students will develop skills in drawing conclusions and critically evaluating results based on data.”

Textbooks:

REQUIRED:

Spatz, C. 2016. *Exploring statistics: tales of distributions*. 11th edition. Outcrop Publishers, Conway, Arkansas, USA.

RECOMMENDED:

Crawley, M. J. 2007. *The R book*. 2nd edition. John Wiley and Sons, West Sussex, England, UK. (**PDF available for free download from OSU library**)

Other materials: Basic calculator. **No mobile phone calculators or programmable graphing calculators allowed on exams.**

Course technology: For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7 (self-service and chat: <http://ocio.osu.edu/selfservice>; email: 8help@osu.edu).

REQUIRED SOFTWARE:

- **Microsoft Office 365:** All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft’s Student Advantage program. Full instructions for downloading and installation can be found <https://ocio.osu.edu/kb04733>.
- **Program R:** <https://www.r-project.org/>. Program R is a free (open source) software environment for statistical computing and graphics. Program R is available for both Windows and MacOS. People from all over the world are turning to R for data analysis. R users make up a community of students, researchers, analysts, and statisticians that benefit from the open exchange of statistical script and packages between users.
- **RStudio:** <https://www.rstudio.com/>. Simply put, RStudio is a software package that helps improve the user experience of R. It provides a set of tools that allows easy access to reference materials and improved visibility of workspace objects, among others. It is generally recommended. RStudio is also provided at no charge (please use the free desktop version found at: <https://www.rstudio.com/products/rstudio/download/>).

GRADING

ASSIGNMENT CATEGORY	POINTS (%)
Exam #1	15
Exam #2	15
Final Exam	15
Weekly homework assignments (12)	24 (4 bonus points)
Labs/lab activities (13)	13
Weekly online quizzes (11)	11 (1 bonus point)
Journal article analysis	2
Participation	10
Total	105/100

See course schedule below for further details.

Late assignments: More information about the assignments and activities will be presented in class. All assignments are ***distributed in lecture*** (you ***must*** attend lecture to receive a homework – no exceptions unless valid university, medical, or family excuse) and are ***due at the beginning of class*** unless otherwise stated. ***Any assignments turned in after the start of the class period will be considered late*** and will receive a 25% penalty. For each additional day the assignment is late, a 25% penalty will be deducted from the final grade. ***No assignment will be accepted after 3 days*** from when it is due unless documentation of a valid excuse is provided. Scanned and emailed copies are not accepted. All homework assignments must be written legibly, with answers clearly marked by circling or putting a box around them. All pages must be stapled together.

Grading scale:

93-100: A	80-82: B-	67-69: D+
90-92: A-	77-79: C+	60-66: D
87-89: B+	73-76: C	<60: E
83-86: B	70-72: C-	

PARTICIPATION AND ATTENDANCE

Student participation: Attendance and participation are very important for your success in this course. Attendance is expected and will be monitored during each lecture and lab.

Note: attendance and participation count towards 10% of your grade.

Policies for this course:

- **Mobile phones and laptops:** Please, silence your phones during class. No surfing the internet (checking email or Facebook), doing assignments, or texting during class or lab unless designated for a specific learning activity by the instructor. **This policy will be strictly enforced, and violations will result in deductions from your final grade.**
- **Recording and photography:** No recording of lectures or photography is allowed in class. If you are concerned about your ability to follow along in class, please talk with the instructor and meet with the teaching assistant.
- **Computer lab:** Unless otherwise specified, lab sections will meet in Kottman Hall #114. On some occasions, the class will meet in another location. All computer lab activities will be turned in the day of the lab. Therefore, if you miss lab, you will not earn points for the day unless excused or special arrangements are made with the instructor.
 - You are expected to attend the computer lab section that you signed up for. Only in limited situations and with prior permission of the instructor, will you be allowed to change lab sections.
- **Exams:** Exams will take place on the specified dates and times. Only in rare, extenuating circumstances can they be taken early or late, and this will require documentation by university authorities.
- **Textbook:** Topics throughout the semester require **reading** the associated textbook chapter before lectures. Keeping up with textbook readings is paramount to excelling in this course. In some instances, a topic may not have been covered in depth during lecture before it appears on a quiz, for example. Quizzes and other assignments are designed to ensure that textbook readings are being done.
- **Homework:** Homework will be assigned and distributed in class, generally Thursdays before each assignment is due. You must attend lecture to receive homework assignments. Only in extenuating circumstances (valid excuse) will we distribute a homework assignment if you miss lecture. Each assignment will be due on Thursdays at 3:00 PM before lecture. Any assignment turned in after lecture begins or after lecture will be considered late. A 25% deduction will be applied to homework assignments for each day that a homework is submitted late.
- **Labs/lab activities:** Generally, lab activities will be conducted within lab sections and turned in before leaving lab (mostly through electronic submission to Carmen). In some instances, it is acceptable to submit a lab within one week it is assigned for more extensive labs.
- **Online quizzes:** Throughout the semester, weekly online quizzes will be assigned for you to complete. These quizzes are based mostly on reading from the textbook and some material covered in lecture. The quizzes will be administered through Carmen. To get credit, the quiz must be completed by each Friday at 5:00 PM. The quizzes are designed to ensure that you are keeping up with reading the textbook.

- **Journal article analysis:** A review of a journal article will be assigned. More details will be described in class. The purpose of the assignment will be to provide student experience with reviewing the statistical rigor of an analysis in the primary literature.
- **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.
- **Concerns:** If you have concerns about the course, please schedule a time to meet with the instructor or teaching assistant to discuss them. **Any questions regarding grades must be received within one week of receiving the grade.**

COURSE SCHEDULE*

Week	Monday (Lab)	Tuesday (Lecture)	Wednesday	Thursday (Lec. & Lab)	Friday	Topic (Lab)
1	January 7 <i>Lab 1</i>	8 Chapter 1		10 Chapter 2 <i>Lab 1</i>		Intro. & Freq. Distr. (Lab 1: Intro.)
2	14 <i>Lab 2</i>	15 Chapter 2		17 Chapter 3 <i>Lab 2</i> HW #1 due	Carmen quiz #1 due 5PM	Freq. Distr. & Central Tendency (Lab 2: R intro)
3	21 MLK Day No Classes	22 Chapter 3 & 4		24 Chapter 5 <i>Lab 3</i> HW #2 due		Central Tendency, variability, etc. (Lab 3: R basics)
4	28 <i>Lab 4</i>	29 Chapter 5		31 Chapter 6 <i>Lab 4</i> HW #3 due	Carmen quiz #2 due 5PM	Correlation & regression (Lab 4: Descr. stats)
5	February 4 <i>Lab 5</i>	5 Chapter 6		7 Chapter 7 <i>Lab 5</i> HW #4 due	Carmen quiz #3 due 5PM	Theoretical D. & Probability (Lab 5: Descr. stats)
6	11 <i>Lab 6</i>	12 Chapter 7		14 Chapter 7 <i>Lab 6</i> HW #5 due	Carmen quiz #4 due 5PM	Normal distribution (Lab 6: Exam #1 review)
7	18 <i>Lab 7</i>	19 Exam #1 (Chapt. 1-7)		21 Chapter 8 <i>Lab 7</i> HW #6 due	Carmen quiz #5 due 5PM	Sampling (Lab #7: Excel)
8	25	26 Chapter 8 (M&M sampling activity)		28 Chapter 8		Sampling (No labs)
9	March 4 <i>Lab 8</i>	5 Chapter 9		7 Chapter 9 <i>Lab 8</i> HW #7 due	Carmen quiz #6 due 5PM	Hypothesis testing (Lab #8: NHST)

Week	Monday (Lab)	Tuesday (Lecture)	Wednesday	Thursday (Lec. & Lab)	Friday	Topic (Lab)
10	Spring break 11	Spring break 12	Spring break	Spring break 14	Spring break	Spring break
11	18 Lab 9	19 Chapter 10		21 Chapter 10 Lab 9 HW #8 due	Carmen quiz #7 due 5PM	Type I & Type II error (Lab #9: One-sample <i>t</i> -test)
12	25 Lab 10	26 Chapter 10		28 Chapter 10 Lab 10 HW #9 due	Carmen quiz #8 due 5PM	Two-sample <i>t</i> -test (Lab #10: Exam #2 review)
13	April 1 Lab 11	2 In class activity		4 Exam #2 (8- 10) Lab 11 HW #10 due	Carmen quiz #9 due 5PM	Paired <i>t</i> -test (Lab #11: Journal article)
14	8 Lab 12	9 Chapter 11		11 Chapter 11 Lab 12 HW #11 due	Carmen quiz #10 due 5PM	ANOVA (Lab #12: two-sample <i>t</i> -test)
15	15 Lab 13	16 Chapter 12		18 Chapter 14 Lab 13 JA due HW #12 due	Carmen bonus quiz due 5PM	RM ANOVA & Chi-square (Lab #13: ANOVA & Chi-square)
16	22 No lab	23	24	25	26	
17	29 Final exam 4:00-5:45 PM Chapters >11	30	May 1	2	3	

*** Daily lecture topic/chapter readings may be subject to change throughout the semester.**

UNIVERSITY ACADEMIC POLICY

Ohio State's Academic Integrity Policy: Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct." The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Mental health: A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the quarter are encouraged to contact the College of Pharmacy Office of Student Services in room 150 Parks Hall (614-292-5001) OR OSU Counseling and Consultation Services (614-292-5766) for assistance, support, and advocacy. This service is free and confidential.

ACCESSIBILITY ACCOMMODATIONS

Requesting accommodations: If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential. In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University. Go to <http://ods.osu.edu> for more information.