



THE OHIO STATE UNIVERSITY

STATISTICS: 2450 INTRODUCTION TO STATISTICAL ANALYSIS I SPRING 2016

Course overview

Instructor

Dr. Jonathan R. Baker baker.375@osu.edu (614) 688 - 4546
Cockins 419 W 9a – 10a, Notably: T 11:30 – 12:15p, T2p – 230p (possibly in KN 0177)

Teaching Assistant

Additional Contact(s)

Meeting Days/Times

TR 12:40p – 1:35p Knowlton 250 Supplemented by a 1-hour recitation on Thursdays @ _____

Course description

Calculus-based introduction to statistical data analysis. Includes sampling, experimental design, probability, binomial and normal distributions, sampling distributions, inference, regression, ANOVA, two-way tables. The prerequisite for this 3 credit hour course is differential calculus.

Your Support System

Lectures	Provide the overarching view of the clusters of concepts.
Recitations	Reinforce and extend content covered in lecture. Students should expect to be active participants in these sessions. They convene Thursdays at 1:50p. or 3p
Tutor Hours	Are in Cockins (CH) 132 and provide you with additional support on a walk-in basis M- R 9:10a – 5:20p & Fridays 9:10a – 12:45p.

Primary Course Goal:

- To develop skills in drawing conclusions & critically evaluating results based on data.

Course Objectives:

- To enable you to use statistical tools for presentation and descriptions of data
- To enable you to correctly apply probability rules and counting techniques.
- To enable you to understand the use of sampling distributions as the foundation of inference.
- To enable you to analyze data through linear regression, confidence intervals, and hypothesis tests.
- To enable you to use your knowledge of calculus to conceptually understand its role in computing probabilities.

Course learning outcomes

By the end of this course, students should successfully be able to:

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

Dr. Baker's vision for your completion of STAT 2450

- You will become proficient in collecting, organizing, analyzing, and interpreting data
- You will become competent in the use of data analysis software.
- You will conceptually understand situations involving random phenomena.
- You will interpret findings and improve your ability to justify your results.
- Your metacognition & desire to reflect upon what you have learned will be heightened.
- You will respond to a problem by: considering any relevant assumptions, analyzing, and effectively communicating your results.
- You will gain a greater appreciation for statistics (and the underpinning mathematics).
- You will complete the Data Analysis GE requirement.

Personal Vision Statement & Commitment

Personal <u>Vision Statement</u> for STAT 2450:	Personal <u>Commitment</u> to STAT 2450:
By successfully completing STAT 2450 I will:	To successfully complete STAT 2450, I must:
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Course Materials

Required course materials

- *Introductory Statistics: A Problem-Solving Approach (2nd ed.)* Kokoska.

ISBN 1464157618 or 19781464157615

This course requires electronic access to the accompanying web-based materials via *LaunchPad*. The ebook, quizzes, and homework assignments are all located within this resource.

It is recommended that you purchase both a text and *LaunchPad*. You may purchase the LaunchPad Activation code with the accompanying loose-leaf textbook from Barnes & Nobles <http://ohiostate.bncollege.com/webapp/wcs/stores/servlet/BNCBHomePage?storeId=33552&catalogId=10001&langId=-1>. Learners who pursue this option tend to prefer: using a physical textbook for supplemental annotation, relying on resources that can function independent of the Internet. The cost is \$158.50 for a used text; \$211.35 for a new one.

If you just are **only interested in electronic access to course materials**,

- Access <http://macmillanhighered.com/launchpad/introstats2e>
- Select, "I want to purchase student access."

LaunchPad access is valid for one year and costs \$75+.

The *LaunchPad* course management system that stores your homeworks and quizzes is ready for student registration. Follow these steps to get started. If you need additional guidance, consult the student [Quick Start](#) guide, especially the [system requirements](#) which list recommended browsers.

1. Access <http://www.macmillanhighered.com/launchpad/introstats2e/2819541> *Statistical Analysis I*
2. Bookmark the page to make it easy to return to.
3. Enroll in our course using one of the following options:
 - a. If you have an access code, select "I have a student access code," enter the code exactly as it appears on the card, and click Submit.
 - b. If you don't have an access code, either purchase a text package that includes one OR click "I want to purchase access" and follow the instructions.
 - c. If you need to start working but can't purchase right away, select "I want temporary access" and follow the instructions for a free 21 day trial.

If you have problems registering, purchasing, or logging in, please contact Customer Support. You can reach a representative 24 hours a day, 7 days a week via the [online form](#) or by chat. You can reach a representative by phone (800) 936-6899:

- Monday through Thursday 7:00 a.m. to 3:00 a.m., Friday 7:00 a.m. to 11:00 p.m.
- Saturday 11:30 a.m. to 8:00 p.m., Sunday 11:30 a.m. to 11:00 p.m.

To recap...

Your course URL: <http://www.macmillanhighered.com/launchpad/introstats2e/2819541>

School: Ohio State University - Main

Course Title: Statistical Analysis I

Course Number: STAT 2450

Course Section: 32001

Top Hat

We will use the *Top Hat* software to elicit student responses during lectures. Students will use their smart phones to text responses to questions posed. Please use the following information and the Student Quick Start Guide that is posted on Carmen to complete the registration process. Your username must be name# (e.g. obama3 do not use *obama.3*).

Top Hat course name: **STAT 2450 (Spring 2015)**

Direct Link: TBD 6-digit course code: TBD

Edify

Edify allows you to send questions anonymously to your instructor and fellow classmates both during lecture and out of class. In addition to asking questions, you can reply and attempt to answer other classmates' questions. The purpose of Edify is to get immediate answers to your questions. Each question or reply you send is anonymous to both the instructor and students. This could help you with topics covered during lecture, or, even with homework assignments or, exam preparation outside of class.

Questions, or, tech support needs can be addressed by support@joinedify.com

1. Access TBD then register with your school email address. Use your name.# to register.
2. Copy the temp. password received via email & click the link to go to a sign up page.
3. Fill out all additional information. Click register.
4. Congrats welcome to Edify. Bookmark www.joinedify.com/beta for future sign-ins.

Required supplemental materials

JMP is the statistical software for this course. JMP is free for you to download and will be used in both lecture and recitation. JMP is accessible through our Launchpad portal.

Alternatively, JMP could be installed via <https://osuitsm.service-now.com/selfservice/>

Highly recommended materials

Texas Instruments 83 Plus (or higher) Graphing Calculator.

Grading

Grades

Assignment or category	Percentage	Your Grade
Exam 1 (Tuesday, February 16 th , during lecture)	20%	
Exam 2 (Tuesday, April 12 th , during lecture)	20%	
Final Exam (Thursday, April 28 th , 2 p.m. - 3:45 p.m.)	30%	
Homework Assignments (7 total, 1.43% each, none of them will be dropped)	10%	
Quizzes (7 total, 1.67% each, 1 is dropped)	10%	
Attendance & Participation (Combined For Lecture & Recitation)	10%	
Total	100	

The exact due dates are included in the course calendar.

Grading scale

93–100: A

90–92.9: A-

87–89.9: B+

83–86.9: B

80–82.9: B-

77–79.9: C+

73–76.9: C

70–72.9: C-

67–69.9: D+

60–66.9: D

Below 60: E

Additional Policies, Resources, & Information

Comments about homework assignments

- Assignments will be graded for both completion and correctness.
- Submission of homework at lecture or through the drop box near 413 Cockins Hall requires consent from either Dr. Baker or from your TA.
- Use of homework to study for exams is encouraged.
- In cases when homework is within 1 week of an exam, please consider photocopying your work before you submit it.
- Please: attempt the homework exercises associated with that day's lecture prior to the next lecture.
- Please minimize rounding when completing intermediate steps of your solutions.

Instructor feedback and response time

Grading and feedback

Midterm examinations will be available within **2 recitations**.

E-mail

All course e-mail correspondence must be done through a valid OSU name.n account.

Expect a 24-hour response time when communicating with TAs and lecturers.

We are here to support you, but just not quite in a true "on-demand" sense.

Student participation and responsibility

We expect you to be actively engaged in the learning process. You are responsible for your learning. Schedule a minimum of 6 hours to prepare for this course. This equates to 9 hours weekly when the 3 hours for lecture and recitation attendance are included. Successful students perform a variety of positive academic behaviors like: reviewing the Carmen page, downloading notes, being proactive in contacting a TA or classmate as necessary, etc.. Please seek assistance in managing any non-academic responsibilities prior to any potential for under-performance.

Electronic devices

As a courtesy to fellow classmates, all cellular phones and other electronic devices must be silenced during lectures and recitations. Your engagement with the class will require an attentiveness for note-taking. If necessary, TAs and lecturers can request that students place these devices out of plain view if their usage is deemed irrelevant to instruction.

Academic integrity policy

A guiding principle is that, if you are considering doing something that might be unethical, then **“Don’t do it!!”** This mantra applies to both academic and non-academic settings.

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. Instructors shall 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/>.

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. <http://studentlife.osu.edu/csc/>.

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. In short, if you are considering doing something that might be unethical, then resist and refrain from pursuing it. This will help you in college and well-beyond.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me. Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Grade Appeals

Your TAs are highly capable and follow established rubrics in evaluating your work. Only in the rarest of cases will an exam grade need to be appealed. In these situations:

- a) (within 1 week of receipt of your assessment) Inform your TA of the issue in writing
- b) Attach a statement of the issue at-hand to your work and submit to Dr. Baker.

Make-Up Mid-term Examinations

The established exam dates and times are a priority for both students and university officials. Valid and documented absences during exam dates require final pre-approval from Dr. Baker. In requesting a make-up exam you must communicate with both your TA and Dr. Baker. Your performance on the final exam items most associated with the missed exam will count as the missed exam grade with up to an additional 10% point deduction. If you miss an exam because of an emergency, contact Dr. Baker immediately to request a makeup exam. You'll need to provide evidence of need for rescheduling this exam.

Course Registration and Completion

Students will be able to work with department staff on any ADD and SECTION changes. Students can begin communicating with Jean Scott (Cockins Hall 408A), Tuesday, January 19th.

Date	Event
Friday, January 15 th	The last day to add the course without instructor permission.
Friday, January 22 nd	The last day to register and avoid additional fees.
<i>*Please note that students who are dropped for non-payment are not guaranteed re-enrollment.*</i>	
Friday, February 5 th	The last day to drop without a 'W' appearing on your record.
Friday, March 25 th	The last day to drop the course without petitioning.

Incompletes will only be awarded when 70% of the coursework has been completed.

Accommodations for accessibility

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor of their needs as soon as possible. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; email ods@osu.edu; <http://www.ods.osu.edu/>

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, please contact the Office for Disability Services at [614-292-3307](tel: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.

OSU accessibility resources

Further information and links regarding accessibility at OSU can be found here: <http://ada.osu.edu/resources/Links.htm>

Other Student Resources

Students can find information about academic services available at OSU on this website: <http://artsandsciences.osu.edu/current-students/university-resources>, and about general student services on this website: <http://ssc.osu.edu>.

Spring 2016 STAT 2450 Calendar

Lecture Schedule:

<i>Tuesdays</i>	<i>Thursdays</i>
January 12 Chp.1 An Intro. to Statistics & Statistical Inference	January 14 2.1–2.3 Types of Data, Bar Charts, Pie Charts, Stem-and-Leaf Plots
January 19 2.4 Frequency Distributions and Histograms	January 21 <u>HW 1 Due F 1/22 Qz.1 Due M 1/25</u> 3.1,3.2 Measures of Central Tendency& Variability
January 26 3.3 Empirical Rule, Measures of Position, Box Plots	January 28 4.1 Experiments, Sample Spaces, Events
February 2 4.2 An Introduction to Probability 4.3 Counting Techniques	February 4 <u>HW 2 Due F 2/5 Qz.2 Due M 2/8</u> 4.4 Conditional Probability 4.5 Independence
February 9 5.4 The Binomial Distribution (with ref. to 5.1)	February 11 Short Exam Review 5.4 The Binomial Distribution (with ref. to 5.1)
February 16 Exam 1 (Chps. 1 – 4)	February 18 <u>HW 3 Due F 2/19 Qz.3 Due M 2/22</u> 6.2 The Normal Distribution (with ref. to 6.1)
February 23 6.3 Checking the Normality Assumption 7.1 Statistics, Parameters&Sampling Distributions	October 8 7.2 Sampling Distribution of the Sample Mean
March 1 7.3 Distribution of the Sample Proportion	March 3 <u>HW 4 Due F 3/4 Qz.3 Due M 3/7</u> 8.1 Point Estimation
March 8 8.2 Conf. Int. for a Pop. Mean when σ is Known (z)	March 10 8.3 Conf.Int.for a Pop.Mean when σ is Unknown (t)
March 15 Spring Break (no lecture)	March 17 Spring Break (no lecture)
March 22 8.4 Confidence Interval for a Population Proportion	March 24 <u>HW 5 Due F 3/25 Qz.5 Due M 3/28</u> 9.1, 9.2 Parts of a Hypothesis Tests & Errors
March 29 9.3 Hypothesis Tests for a Pop. Mean when σ is Known(z)	March 31 9.4 P-Values 9.5 Hypothesis for a Pop. Mean when σ is Unknown(t)
April 5 9.5 Hypothesis for a Pop. Mean when σ is Unknown(t) 9.6 Hypothesis Tests for a Population Proportion	April 7 <u>HW 6 Due F 4/8 Qz.6 Due M 4/11</u> 11.1 One-Way ANOVA Short Exam Review
April 12 Exam 2 (Chps. 5 – 9)	April 14 12.1 Simple Linear Regression
April 19 12.2 Hypothesis Tests and Correlation	April 21 <u>HW 7 Due F 4/22 Qz.7 Due M 4/25</u> 13.1 Univariate Categorical Data 13.2 Bivariate Categorical Data
April 26 13.2 Bivariate Categorical Data	April 28 Comprehensive Final Exam 2:00p – 3:45p

