Arts & Sciences
Department of Statistics

THE OHIO STATE UNIVERSITY

STATISTICS: 2450
INTRODUCTION TO STATISTICAL ANALYSIS I
AUTUMN 2016

Course overview

Instructor

Dr. Jonathan R. Baker baker.375@osu.edu (614) 688 - 4546
Office Hours **W 1p –130p** (location near Campbell Hall, after class as nec.), W 9a–10a(CH419)

Teaching Assistant

_____ _____ _____

Additional Contact(s)

_____ _____ _____

_____ _____ _____

Meeting Days/Times

MW 1:50p – 2:45p Campbell (CM) 200. Supplemented by a 1-hour recitation on Fridays @ ___.

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 Fridays at 11:300a, 12:40p, or 1:50p.

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 Vision Statement for STAT 2450:	**Personal Commitment to STAT 2450:**
By successfully completing STAT 2450 I will: • • •	To successfully complete STAT 2450, I must: • • •

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 (LaunchPad). The ebook, quizzes, and homework assignments are all located within this resource. LaunchPad access is valid for one year and cost over $90.

Students may elect to 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 Internet functionality, etc…

Thus, you may choose to purchase either **just the access code with e-book & other resources**:

Introductory Statistics 2e (w/LaunchPad). Kokoska. ISBN 1464157618 or 19781464157615

- You will access: http://www.macmillanhighered.com/launchpad/introstats2e/
  Select, *"I want to purchase student access."*
  LaunchPad access is valid for one year and costs $93.99.
  Select **Ohio State University** -> **Autumn 2016** -> Course #3735468 **(Baker)**

- Click on "I want to purchase access" and complete the process.

OR

- The loose-leaf version of Introductory Statistics 2e (custom edition). Kokoska. 9781319019044 or 1319019048.
  - You will access http://www.macmillanhighered.com/launchpad/introstats2e/
  - Click on "I have a student access code" and complete the process.

Either way, LaunchPad is customized for this course.

- Once registered you will also access LaunchPad through our Carmen site.
  Technical Support can be contacted via 1-800-936-6899, or, through
  http://support.bfwpub.com/supportform/form.php?View=contact

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 (Autumn 2016)**
Direct Link: TBD 6-digit course code: TBD

Peer-Up

PeerUp is a mobile and desktop application that allows classmates to connect to each other to ask questions, work on homework, and study utilizing location-based technology. You begin by logging into the app and indicating for which class they are studying. You can then see other individuals or groups of classmates who are already hard at work either through a map view or a list view. The user simply requests to join one of these sessions, messages their classmate(s) and meets at an agreeable location. As you use the app you earn virtual "points" which can be redeemed at local businesses for free or discounted products. Learn more at www.peerup.co

The app can be accessed by visiting app.peerup.co on your desktop or mobile device. You must create an account using an osu.edu email address and then confirm your account via email.

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 (Wild 'n Out Wednesdays)	Percentage	Your Grade
Exam 1 (Wednesday, October 5th, during lecture)	**20%**	
Exam 2 (Wednesday, Nov. 16th, during lecture)	**20%**	
Final Exam (Wednesday, Dec. 14th 2 p.m. - 3:45 p.m.)	**30%**	
Homework Assignments (7 total, 1.43% each, none are 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 calendar at the end of this document.

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.
- 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.

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.

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

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, August 30th.

Date	Event
Friday, August 26th	The last day to add the course without instructor permission.
Friday, September 2nd	The last day to register and avoid additional fees.
Please note that students who are dropped for non-payment are not guaranteed re-enrollment.	
Friday, September 16th	The last day to drop without a 'W' appearing on your record.
Friday, October 28th	The last day to drop the course without petitioning.

FYI, 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 **098 Baker Hall, 113 W. 12th Ave.;** 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 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.

Autumn 2016 STAT 2450 Calendar

Lecture Schedule:

Mondays	*Wednesdays*
August 22 No Lecture - Autumn Semester Eve	**August 24** Chp.1 An Intro. to Statistics & Statistical Inference
August 29 2.1–2.3 Types of Data, Bar Charts, Pie Charts, Stem-and-Leaf Plots	**August 31** HW 1 Due F 9/2 Qz.1 Due Su 9/4 2.4 Frequency Distributions and Histograms
September 5 No Lecture – Labor Day	**September 7** 3.1,3.2 Measures of Central Tendency& Variability
September 12 3.3 Empirical Rule, Measures of Position, Box Plots	**September 14** HW 2 Due F 9/16 Qz.2 Due Su 9/18 4.1 Experiments, Sample Spaces, Events
September 19 4.2 An Introduction to Probability 4.3 Counting Techniques	**September 21** 4.4 Conditional Probability 4.5 Independence
September 26 5.4 The Binomial Distribution (with ref. to 5.1)	**September 28** HW 3 Due F 9/30 Qz.3 Due Su 10/2 6.2 The Normal Distribution (with ref. to 6.1)
October 3 Short Exam Review 6.3 Checking the Normality Assumption	**October 5** **Exam 1 (Chps. 1 – 4)**
October 10 7.1 Statistics, Parameters&Sampling Distributions 7.2 Sampling Distribution of the Sample Mean	**October 12** HW 4 Due M 10/10 Qz.4 Due M 10/10 7.3 Distribution of the Sample Proportion (Fall Break Eve)
October 17 8.1 Point Estimation	**October 19** 8.2 Conf. Int. for a Pop. Mean when σ is Known (z)
October 24 8.3 Conf.Int.for a Pop.Mean when σ is Unknown (t)	**October 26** HW 5 Due F 10/28 Qz.5 Due Su 10/30 8.4 Confidence Interval for a Population Proportion
October 31 – Booo!!! 9.1, 9.2 Parts of a Hypothesis Tests & Errors	**November 2** 9.3 Hypothesis Tests for a Pop. Mean when σ is Known(z)
November 7 9.4 P-Values 9.5 Hypothesis for a Pop. Mean when σ is Unknown(t)	**November 9** HW 6 Due F 11/11 Qz.10 Due Su 11/13 9.5 Hypothesis for a Pop. Mean when σ is Unknown(t) 9.6 Hypothesis Tests for a Population Proportion
November 14 Short Exam Review 11.1 One-Way ANOVA	**November 16** **Exam 2 (Chps. 5 – 9)**
November 21 12.1 Simple Linear Regression	**November 23** **No Lecture – Thanksgiving Break**
November 28 12.2 Hypothesis Tests and Correlation	**November 30** HW 7 Due F 12/2 Qz.11 Due Su 12/4 13.1 Univariate Categorical Data
December 5 13.2 Bivariate Categorical Data	**December 7 Short Exam Review** 13.2 Bivariate Categorical Data **(Final Exam Wednesday, December 14th 2:00p – 3:45p)**