

STAT 1350: Elementary Statistics

Spring 2016

“Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write.”
--H.G. Wells

Instructor: Dr. Michelle Everson

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Office Location and Phone: 415 Cockins Hall, 614-292-3593

Office Hours: Tuesdays and Thursdays, 11 a.m. to 12 p.m., and by appointment. For those who cannot attend in person office hours, we can arrange to have online office hours via Carmen Connect. A link to Carmen Connect can be found in the **Course Information** section of the course website. It is up to you to make arrangements with the instructor or one of the teaching assistants if you would like to try online office hours.

Note: The instructor will respond to email as quickly as possible, no later than 24 hours after the email has been sent. The instructor and teaching assistants will also carefully monitor discussion boards and respond to questions posted within those forums 24 hours.

Teaching Assistants:

Jiae Kim (kim.3887@buckeyemail.osu.edu)

Sean O’Neill (oneill.90@osu.edu)

Jiayin Zheng (zheng.678@buckeyemail.osu.edu)

Note: More information about Teaching Assistant office hours will be shared during the first and second weeks of the semester.

Tutor Room: The Math and Statistics Learning Center (MSLC) will be open beginning Week 2 of the semester (January 19th), in 132 Cockins Hall. Hours are from 9:10 a.m. until 6:20 p.m. Monday through Thursday, and from 9:10 a.m. until 1:40 p.m. on Friday. Although this is an online course, STAT 1350 teaching assistants will be in this Tutor Room throughout the day if you are able to be on campus and if you need help, and we strongly encourage you to stop by with questions! By the start of Week 2, the Tutor Room schedule will be posted in the **Course Information** section of the course website.

Course Goals

This course satisfies the learning goals of the *GE Data Analysis requirement*, which are to develop an understanding of the basic ideas of statistics, statistical reasoning, and probability, to comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas. The course seeks to encourage students to actively think about statistical issues arising in real problems and to understand the basic statistical techniques used to generate, summarize, and draw conclusions from data.

Getting Started with the Online Course

The best way to get started with the course is to spend some time exploring the course website. Go to www.carmen.osu.edu to log on to Carmen. You should then see a link for the STAT 1350 site. Look carefully at the resources on the homepage, and then click the **Content** tab near the top to get to the Table of Contents. From there, you can review more information about the course and see the overviews for each week. Note that not all course overviews will be posted at the beginning of the semester, but we will slowly add more and more to the course site. We hope the course site will be relatively easy for you to navigate, but if you are ever in doubt about anything, let us know! We also encourage you to watch the introductory video on the course homepage.

Required Materials

Text: *Statistics Concepts and Controversies* 8th edition by David Moore and William Notz

Software: There will be certain assignments this semester that will require the use of statistical software. To make these assignments easy for you to complete, we have chosen to use a free online program called StatKey. You can access StatKey at <http://www.lock5stat.com/statkey/index.html>. In the **Course Information** section of the course site, there is a **StatKey References** section that includes a StatKey Reference guide and will later include videos that will help you when we begin using this software in class. You will not be expected to use StatKey until Week 5 of the semester, and you will only be asked to use it to help complete lab activities.

Calculator: A simple calculator (with a square root key) will also be necessary for STAT 1350.

Course Technology

The baseline technical skills necessary for this online course are as follows:

- Successful students will possess basic computer and web-browsing skills
- Students will be familiar with navigating Carmen (the following website may help you if you encounter difficulties with Carmen: <http://odee.osu.edu/resourcecenter/carmen>)
- Students will need to be proficient with the MS Office Suite

Technology skills necessary for this specific course:

- CarmenConnect text, audio, and video chat. If you need technical assistance, either call 8-HELP, or refer to the online instructions: <http://resourcecenter.odee.osu.edu/carmenconnect>.

Necessary equipment and technology:

- Computer: current Mac or PC
 - Mac minimum requirements for JMP: OSX 10.6 or later, 1GB RAM, 500MB free hard disk space
 - PC minimum requirements for JMP: Pentium 4 or higher, Windows XP or later (Home Basic Editions not supported), 1GB RAM, 500MB free hard disk space, and True (24bit+) color with resolution 1024x768 or greater.
- Internet Browser: Internet Explorer 6 or later, or Firefox (Chrome is not supported by Carmen, or CarmenConnect. Further CarmenConnect recommendations are listed on this website <http://resourcecenter.odee.osu.edu/carmenconnect>)

- Robust high-speed internet connection
- Webcam: built-in or external webcam, fully installed
- Microphone: built-in laptop or tablet mic or external microphone
- It is assumed that all students have access to Adobe Reader (to view PDF files: <http://get.adobe.com/reader/>) and to the MS Office Suite (in order to use Word and Excel). You should also have Adobe Flash Player installed (<http://get.adobe.com/flashplayer/>).

IMPORTANT NOTE: It is not required that you use CarmenConnect in this course, but we strongly encourage you to try to use CarmenConnect as a way of communicating with the instructor and/or teaching assistant if you need extra help. We will use this platform for online office hours (when requested), and we want you to feel comfortable using it as well.

Grading

Your final grade in this course will depend on the following. Each of these assignments is discussed in more detail below.

| Assignment | Points |
|---|-------------------|
| Homework assignments (10 points each for 80 points ; lowest will be dropped) | 70 points |
| Lab activities (10 points each for 120 points; lowest will be dropped) | 110 points |
| Statistics Journal Assignment | 36 points |
| Participation in Discussion (3 points each for 27 points; lowest will be dropped) | 24 points |
| Midterm Exam #1 (Monday, February 22nd, 2016, 5:20-6:15 p.m.) | 50 points |
| Midterm Exam #2 (Monday, March 28th, 2016, 5:20-6:15 p.m.) | 50 points |
| Final Exam (Friday, April 29th, 2016, 6-7:45 p.m.) | 100 points |
| Total | 440 points |

Final grades in the course will be determined based on the following scale, and based on the percentage of total points (including extra credit) that you earn during the semester.

| Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | E |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Min % | 93% | 90% | 87% | 83% | 80% | 77% | 73% | 70% | 67% | 60% | ≤59% |

More about Completing Required Course Assignments in the Online Course

To help you navigate through the online environment, we have attempted to create a very consistent structure from week to week. When you log on to the Carmen site and click on the **Content** tab, you will see that each week shows up as a section within the Table of Contents, and there is an overview that goes along within each week. When you click on the link for the weekly overview, you will see a new template that includes all

objectives for the week and links to lecture videos and all assignments and activities for the week. There are weekly deadlines that need to be met within the online course, but there is flexibility in terms of when you can do your work, and we will consistently monitor the course site and jump in whenever necessary to help you.

Homework: Links to homework assignments can be found within many weekly modules. Each homework assignment consists of 10 multiple-choice questions. Each question is worth 1 point, and you will complete these assignments through Carmen by the appropriate deadline. Although the assignments are set up using the Quiz tool in Carmen, they are not “quizzes” in the traditional sense. You can have as much time as you need to complete assignments before the deadline and you can use any resources you would like, but once you officially submit your work to be graded, you cannot change any of your answers, and you get just one attempt to work on each homework assignment. Once the deadline has passed, the assignment will be automatically graded and you will receive feedback. Please refer to the document “**READ FIRST Completing Homework Assignments and Reviewing Feedback**” in the Course Information—Completing Homework Assignments and Reviewing Feedback section of the course website (within the Content area) for details on how you can see feedback on your homework assignment. If you do not attempt to complete a homework assignment, you will not have any access to assignment feedback or to the correct answers for each homework question. Most homework assignments will be due on **Sundays** by **11:55 p.m.** The exception is Homework Assignment 3 and Homework Assignment 6; these assignments will be due on Friday at 11:55 p.m. The lowest homework score will automatically be dropped from your grade. Please note that PDF copies of each homework assignment can be found in the “Completing Homework Assignments and Reviewing Feedback” page within the **Course Information** area.

Lab activities: There are several lab activities that you will complete during the semester. These activities provide you with opportunities to apply and extend what you are learning in your reading and through lectures. During the weeks in which you have lab activities, links to the activities will be posted within the weekly overview. We will also post links to the lab activities in a special “Lab Activities” section within the **Course Information** area. Each activity will involve several questions that will require short answers, and you should save your work as a Word or PDF file and then submit it through the appropriate Dropbox link within the weekly overview. Lab activities are always due on **Fridays** by **11:55 p.m.**, with the exception of Lab Activity #1 (a quiz about the syllabus and course website and a pre-course assessment) which will be due the first Sunday of the semester (at 11:55 p.m.), and Lab Activity #12 (another online quiz) that will be due the final Monday of the semester (at 11:55 p.m.). We strongly encourage you to start the activities early and to post questions about the activities in the appropriate Carmen discussion forums if you need help (separate forums will be set up each week for questions related to the content for the week). Ideally, the lab activities will provide you with opportunities to interact with your peers and help your peers. The lowest lab activity score will be dropped from your grade. *Each lab activity is graded mostly based on completeness, but we do select random problems to grade for correctness.* For this reason, it is important that you answer all questions on each activity and ask for help if you need it! The teaching assistants will grade your lab activities and you can generally expect feedback within 7 days.

IMPORTANT clarification about Lab Activity #1:

Lab Activity #1 consists of two distinct online quizzes that you will need to complete no later than **Sunday, January 17th**, at **11:55 p.m.** The first quiz is our **STAT 1350 Pre-assessment**. We want you to take this short 10-item quiz so that we can get a better sense of what you might already know about statistics. We will not penalize you if you miss any questions on this quiz, but it’s important that you try your best and attempt to answer all questions on the pre-assessment. You can find this quiz on the Carmen course site by going to the Activities tab,

selecting Quizzes, and then clicking on the link for the STAT 1350 Pre-assessment. You can also find a link within the Week 1 Overview. You will have only one attempt at completing the pre-assessment, and you should try to complete it within 30 minutes. The second quiz you will need to complete is a **Syllabus Quiz**. You can again find the syllabus quiz by going to the Activities tab, selecting Quizzes, and clicking on the Syllabus Quiz link (or by clicking on the appropriate link in the Week 1 Overview). The syllabus quiz also consists of 10 questions. You will again have just one attempt at taking the syllabus quiz, and you will get credit for each question you get right on the this quiz. You can take as much time as you need to complete the syllabus quiz, provided that you submit your quiz no later than Sunday, January 17th, at 11:55 p.m. We strongly encourage you to carefully read through this syllabus (or have it handy) before taking the syllabus quiz to ensure that you get the highest grade possible.

Statistics Journal Assignment: Statistical information is all around us, all the time. The purpose of this assignment is for you to keep track of information you are seeing outside of class that relates to important course content. In particular, we would like for you to keep a journal where you write about examples you are finding in the media where statistics is being used and discussed. You can write about news articles that report the results of studies, poll results, blog posts, interesting graphical displays of data, or other appropriate examples. Please see the **Statistics Journal Assignment** handout on Carmen, in the **Course Information** section, for more details about this assignment. To get full credit, you will need to complete six journal entries. Each entry will involve a description of your chosen item, a discussion of how the item relates to something you learned through your textbook reading or through lecture, and a critique of the item. You will submit three of your journal entries the week before Midterm Exam #1 (at the end of Week 6), and you will submit the remaining three entries soon after Midterm Exam #2 (at the end of Week 12). You will submit our journal via Dropbox links found within the Week 6 and Week 12 overviews.

Participation in Discussion: Beginning Week 2, you can earn points toward class participation by participating in various class discussion assignments. You will see links to the required discussion assignments within the “Assignments” section in the overview for the week. Throughout the semester, we will post various discussion assignments within the weekly overviews (please note there will be some weeks when there are no required discussion assignments). You can earn up to 3 points toward your participation grade for participating in these discussions. To get full credit for each discussion, you need to begin by posting your own answer to the problem (worth 1 point, regardless of the correctness of your answer). You should then plan to return to the discussion at least two times before the discussion deadline to respond in a meaningful way to answers posted by your peers (or to answer questions that are asked of you by your peers, by the instructor, or by the teaching assistants). Returning at least twice to the discussion will earn you two more points. We hope these discussions will be a time for you to wrestle with challenging concepts, ask questions, and get extra help. There will be a total of 9 discussion assignments posted throughout the semester; as long as you complete 8 of these assignments and participate fully in those discussions, you should earn full credit for this component of the course.

Exams: This course has two common midterms and a common final. Exams will all be on Mondays. It is important that you make preparations to be available during the exam times listed above (in the Grading section) and that you attempt to take these exams on campus with all other STAT 1350 students. More details about the exact locations of the exams will be sent out as we get closer to exam time. Students who have an unavoidable conflict should e-mail the instructor at least one week prior to each exam to make appropriate arrangements for taking an alternate or make-up exam. If you will be unable to

take the exam with other STAT 1350 students at the times we have designated on campus, we can attempt to make arrangements for you to take the exams at the campus testing center. The Ohio State University (OSU) Testing Center (<http://registrar.osu.edu/testing/>) is an acceptable proctoring site, and offers appointments Monday-Friday 8a.m. to 5 p.m. If you need to take the exam in a different location, there may be proctoring fees. **Please contact the instructor immediately to begin making preparations for exams if this will be an issue.** All exams are closed book. For each of the midterm exams, students may use one 8.5 inch x 11 inch page of notes (front and back). For the final exam, students may use two 8.5 inch x 11 inch pages of notes (front and back). You should also bring a calculator and a photo ID to the exams. Devices such as cell phones with calculator *and* communication capabilities are not allowed. Devices such as iPods are also prohibited at the exam. Please note that it will be necessary for you to make an appointment to meet with the instructor if you would like to receive a copy of your graded midterm exams. Alternatively, in extreme circumstances, we can make arrangements to scan your work and send it to you.

Late and Missed Work

Late Work: *Absolutely no late work will be accepted.* You should allow sufficient time to complete homework assignments, lab activities, and the Statistics Journal Assignment so that you can get help if you need it. Computer failures, lost files and other technical difficulties are not valid excuses for submitting an assignment late. It is for this reason that we do allow you to drop one homework assignment and one lab activity from your grade, with no questions asked.

Missed Work: Students who are unable to attend an exam for a legitimate unavoidable reason may take a make-up exam only if the student provides suitable documentation of the absence and takes the make-up in a timely manner. Students who miss a lab activity or homework assignment for a legitimate reason should use their dropped score for the first absence. Make-up work for subsequent legitimate absences must be discussed with the instructor.

Disputes about Grades

If you feel that an assignment has been graded incorrectly or unfairly, you must speak with one of the teaching assistants or the course instructor within one week of getting your grade on that assignment. We will not re-grade assignments at the end of the semester if you are not satisfied at that time with your final course grade.

Addressing Issues of Differing Abilities

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

Accessibility of course technology: This online course requires use of Carmen (Ohio State's learning management system) and other online

communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with me.

OSU accessibility resources: Further information and links regarding accessibility at OSU can be found here:

<http://ada.osu.edu/resources/Links.htm>.

Course Outline

The following is a general outline of the course, and it is subject to change at the discretion of your instructor. Any changes will be announced on Carmen. Ideally, you should attempt to complete readings before watching and listening to the accompanying lecture video(s). It is expected that everyone listen to the lectures and review the lecture notes since there are occasionally topics covered in lecture that are not covered in the book.

| Date | Week | Topic | Readings | Assignments due* |
|---|------|---|----------------------|---|
| 1/11-1/17 | 1 | Data/Samples | Chapters 1 and 2 | Lab 1 (1/17) |
| 1/18-1/24 | 2 | More on Sampling/Surveys | Chapters 3 and 4 | Lab 2 (1/22)/Homework 1 (1/24)/Discussion #1 (1/24) |
| 1/25-1/31 | 3 | Experiments/Measuring | Chapters 5, 6, and 8 | Lab 3 (1/29)/Discussion #2 (1/31) |
| 2/1-2/7 | 4 | Do numbers make sense?/Graphs | Chapters 9 and 10 | Lab 4 (2/5)/Homework 2 (2/7)/Discussion #3 (2/7) |
| 2/8-2/14 | 5 | Graphs/Summary Statistics | Chapters 11 and 12 | Lab 5 (2/12)/Discussion #4 (2/14) |
| 2/15-2/21 | 6 | Summary Statistics | Chapter 12/Review | Homework 3 (2/19)/Statistics Journal (Part 1; 2/19) |
| 2/22-2/28 | 7 | Midterm 1 /Normal Distributions | Chapter 13 | Lab 6 (2/26)/Discussion #5 (2/28) |
| 2/29-3/6 | 8 | Correlation/Regression | Chapters 14 and 15 | Lab 7 (3/4)/Homework 4 (3/6) |
| 3/7-3/13 | 9 | Regression/Probability | Chapters 15 and 17 | Lab 8 (3/11)/Homework 5 (3/13)/Discussion #6 (3/13) |
| HAPPY SPRING BREAK!!!! (3/14-3/20) | | | | |
| 3/21-3/27 | 10 | More Probability and Review | Review | Homework 6 (3/25) |
| 3/28-4/3 | 11 | Midterm 2 /Confidence Intervals | Chapters 18 and 21 | Lab 9 (4/1)/Discussion #7 (4/3) |
| 4/4-4/10 | 12 | More Confidence Intervals/Hypothesis Testing | Chapters 21 and 22 | Lab 10 (4/8)/Statistics Journal (Part 2; 4/10)/Discussion #8 (4/10) |
| 4/11-4/17 | 13 | More Hypothesis Testing | Chapters 22 and 23 | Lab 11 (4/15) /Homework 7 (4/17)/Discussion #9 (4/17) |
| 4/18-4/24 | 14 | More Hypothesis Testing/Review | | Homework 8 (4/22) |
| 4/25-5/1 | 16 | Last day of instruction is April 25 th Final Exam is Friday, April 29 th at 6 p.m. | | Lab 12 (Monday 4/25) at 11:55 p.m. (NOTE SPECIAL day!) |

*Assignments are always due at 11:55 p.m. on either Fridays or Sundays, with the exception of Lab 12.

Academic Misconduct

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/>.

We take academic misconduct very seriously in this course. If you are suspected of behaving dishonestly during an exam (e.g., copying from another student’s exam, allowing another student to copy from your exam, using materials or devices that are prohibited) or when completing any other required course assignment, this is grounds for us to file a report with the Committee on Academic Misconduct (COAM), and this may result in a failing grade in this course or an even more severe penalty.

Creating a Respectful and Safe Class Environment

We want STAT 1350 to be an environment where you can feel safe to express your thoughts and ideas about what you are learning about. You can expect fair, consistent, and respectful treatment from the entire Stat 1350 teaching team. We expect all students to treat fellow students, TAs, and lecturers, with respect in your behavior, attitude and communications, be they in-person discussions or email. Again, the OSU Code of Student Conduct, is at <http://studentlife.osu.edu/csc/>

E-mail Correspondence: In order to protect your privacy, all course e-mail correspondence *must* be done through a valid OSU name.number or Buckeyemail account. If you have not activated your OSU email account, you can activate your account at <https://acctmgt.service.ohio-state.edu>. Note that it is your responsibility to make sure that any email messages you send (to the instructor or one of the teaching assistants) are received.

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>.

Tips for Success in the Course

We are here to help you be successful in the course, but a lot of your success will be up to you. From our own experience with this course and with other online courses, we believe the following can help you to do well in this course.

- You are responsible for your learning. Distance courses afford flexibility in how you learn, where you learn, and when you learn, but it is critical that you manage your time wisely. You should expect to spend a minimum of 9 hours weekly in this course. You should also expect to log on to Carmen at least two or three times per week to review weekly overviews, watch and listen to recorded lectures, complete lab activities, complete homework assignments, and keep up with important news and announcements posted on the home page of the course site.

- On a weekly basis, the instructor will send out an email message to the entire class to remind you about important due dates. You are responsible for these email messages, and they will be sent at the start of each week, to your OSU email account. We will also attempt to continuously post important news and announcements on the course homepage, and you are responsible for reading this information.
- This is NOT a math class. This is a critical thinking class. Our goal is to help you make wise and educated decisions at work and in life. We recognize that some of you might be nervous about the course, but we want you to know that we are here to help you. Please take advantage of opportunities to post questions in discussion forums and to answer questions posted by your peers. Teaching others can be a great way to help you learn important material. Also, please do not hesitate to contact the instructor or teaching assistant if you feel you need extra help or if you want to arrange times to meet in person (or meet through Carmen Connect).
- Your peers can be an excellent source of information. We encourage you to collaborate with your peers on different assignments and help each other, but keep in mind that you must submit your own individual work. Also, you cannot collaborate on exams!
- We strongly encourage you to avoid working on assignments until the very last minute. We want to help you if you run into problems, and it can be challenging for us to help if you do not ask questions in a timely manner.
- Try to find ways to organize the material you will see on the course website. This can be incredibly helpful when it comes time to studying for exams. Print out the slides that accompany each lecture video (these slides are saved as PDF handouts so you can take notes as you are watching and listening to lectures), and print out your graded lab assignments. Review your answers to homework questions and contact us to talk about any problems you missed. Purchase a binder where you can sort your printed notes and assignments by chapters or topics.
- Material will get more challenging as we go through the semester. Because of this, you may need to spend more time studying material that is covered later in the semester versus material covered earlier in the semester.