STAT 216: Introduction to Statistics

Fall 2021 Syllabus

Contents

Instructor contact information

Your primary contact in STAT 216 is your instructor. If you have concerns that cannot be answered by your instructor, you may reach out to the Student Success Coordinator or the Course Supervisor.

Refer to your section's **Instructor Contact Information under D2L Content** for your instructor and co-instructor/TA contact information.

Student Success Coordinator

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Assistant Coordinator

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Course Supervisor

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Course calendars

- STAT 216 calendar
- MSU academic calendar

Course description

Stat 216 is designed to engage you in the statistical investigation process from developing a research question and data collection methods to analyzing and communicating results. This course introduces basic descriptive and inferential statistics using both traditional (normal and t-distribution) and simulation approaches including confidence intervals and hypothesis testing on means (one-sample, two-sample, paired), proportions (one-sample, two-sample), regression and correlation. You will be exposed to numerous examples of real-world applications of statistics that are designed to help you develop a conceptual understanding of statistics. After taking this course, you should be able to:

- Understand and appreciate how statistics affects your daily life and the fundamental role of statistics in all disciplines
- Evaluate statistics and statistical studies you encounter in your other courses
- Critically read news stories based on statistical studies as an informed consumer of data
- Assess the role of randomness and variability in different contexts
- Use basic methods to conduct and analyze statistical studies
- Evaluate and communicate answers to the four pillars of statistical inference: How strong is the evidence of an effect? What is the size of the effect? How broadly do the conclusions apply? Can we say what caused the observed difference?

MUS STAT 216 learning outcomes

1. Understand how to describe the characteristics of a distribution.
2. Understand how data can be collected, and how data collection dictates the choice of statistical method and appropriate statistical inference.
3. Interpret and communicate the outcomes of estimation and hypothesis tests in the context of a problem.
4. To understand the scope of inference for a given dataset.

CORE 2.0

This course fulfills the Quantitative Reasoning (Q) CORE 2.0 requirement because learning probability and statistics allows us to disentangle what's really happening in nature from "noise" inherent in data collection. It allows us to evaluate claims from advertisements and results of polls and builds critical thinking skills which form the basis of statistical inference. Students completing a Core 2.0 Quantitative Reasoning (Q) course should demonstrate an ability to:

Interpret and draw inferences from mathematical models such as formulas, graphs, diagrams or tables. Represent mathematical information numerically, symbolically and visually. Employ quantitative methods in symbolic systems such as, arithmetic, algebra, or geometry to solve problems.

Prerequisites

Entrance to STAT 216 requires at least one of the following be met:

- Grade of C- or better in a 100-level math course (or equivalent)
- Grade of B or better in MATH 096
- Level 30 on the Math Placement Exam or a combination of a good score on Math portion of SAT (540 or higher) or ACT (23 or higher) and/or good high school GPA

- See the Math Prerequisite Flowchart for more details.

You should have familiarity with computers and technology (e.g., Internet browsing, word processing, opening/saving files, converting files to PDF format, sending and receiving e-mail, etc.).

Course materials and resources

Online textbook and coursepack

Two "textbooks" are required for this course:

1. *Montana State Introductory Statistics with R* — our free, online textbook
2. *STAT 216 Coursepack* — workbook with reading guides and in-class activities and labs

The *Stat 216 Coursepack* of in-class activities is available for purchase in the MSU Bookstore. You may purchase the coursepack in person, or you may purchase online and have the coursepack shipped to you. Students are expected to bring the coursepack to class each day and to complete the activities within the coursepack. Chapter 1 of the coursepack is provided here if you do not have the coursepack by your first day of class.

- *STAT 216 Coursepack*: Preface
- *STAT 216 Coursepack*: Chapter 1

RStudio

We will be using the statistical software R through the IDE RStudio for data visualization and statistical analyses.

You will access this software through the MSU RStudio server: rstudio.math.montana.edu. Your username is your 7-character NetID (in the form x##x###, where x is a letter and # is a number), and your password is the password associated with your NetID. Your email address will not work to log in to the RStudio server.

- Please note: Your netID password expires every 6 months. It is HIGHLY recommended that you reset your netID password BEFORE attempting to login to the Rstudio server. You can reset your netID password in the MSU password portal.

See the Statistical Computing section in the Welcome chapter of our textbook for alternative options for accessing RStudio.

Learning management tools

- **D2L**: Find your instructor and co-instructor/TA contact info, announcements, exploration information, instructor notes, exam review material, assignment and data files, discussion forums, gradebook.
  - *Important*: Make sure you are receiving email notifications for any D2L activity. In D2L, click on your name, then Notifications. Check that D2L is using an email address that you regularly check; you have the option of registering a mobile number. Check the boxes to get notifications for announcements, content, discussions, and grades.

  - If you have a question about the course materials, computing, or logistics, please post your question to your D2L discussion board instead of emailing your instructor. This ensures all students can benefit from the responses. Other students are encouraged to respond.

- **Gradescope**: Submit and review quizzes and assignments, review exam grades. For more details, see our Gradescope Help for Students document
- **Math Learning Center**: Free drop-in tutoring for 100- and 200-level math and stat courses.

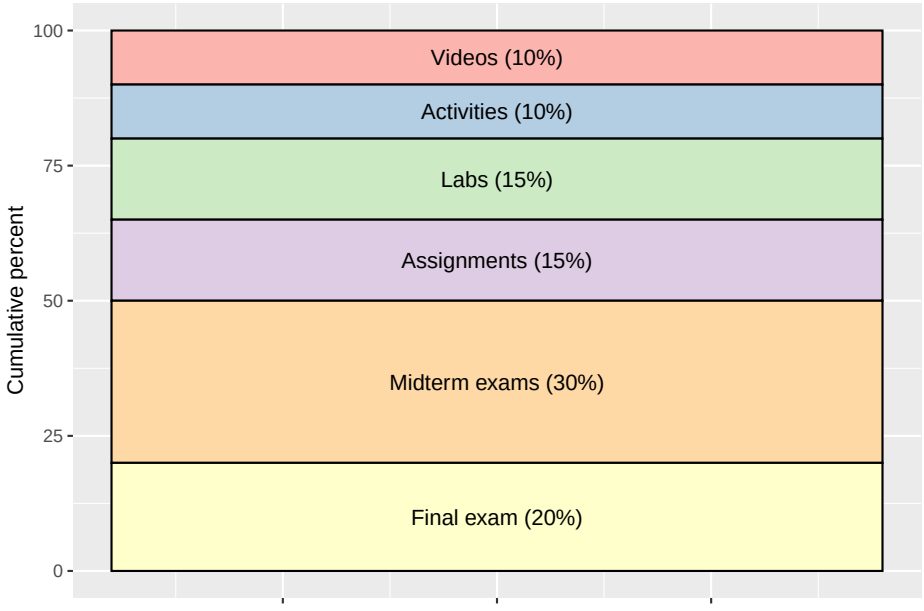
Course format and organization

Stat 216 will meet 3 times per week. Each week, students will:

- **read** assigned sections of the online textbook and **watch videos** on that week's content ***prior*** to attending your assigned in-person class day, including concept check video quizzes embedded in the videos,
- meet with your fellow students in your assigned classroom three class periods per week for **in-class group activities and discussion** (Mondays and Wednesdays) and **in-class Rstudio labs** (Friday),
- complete one **assignment** in Gradescope.

Course assessment

Your grade in STAT 216 will contain the following components.



Videos (10%)

You will be expected to complete the assigned textbook reading and D2L videos using the reading guides provided in the coursepack prior to attending the in-class activity for each week. Concept check quiz questions will be embedded in the videos up through the due date. Up until the deadline, you can retake the video quizzes as many times as you like (the most recent grade will be recorded in D2L). *(Note that if you re-watch a video without taking the quiz, D2L will record a zero for that quiz, even if you took the quiz previously.)* After the due date, videos will still be available to review, but quiz questions will no longer be included in the video.

- Video quizzes are due **Sunday at 8pm Mountain Time each week**.
- The two lowest video grades will be dropped.

Activities (10%)

Every Monday and Wednesday, you will meet with your classmates and instructor to work through that day's coursepack group activity. Attendance and completion of the activity counts towards this portion of your grade.

- Activities must be completed in the Stat 216 Coursepack. **If you prefer to complete the activity on a pdf copy using a stylus-enabled device, please speak to your instructor, and he or she will provide you with a PDF copy of the coursepack.**
- Activities will be checked for completion at the **beginning of the following class period**.
- If you have an excused absence the day the activity is due (e.g., quarantine or ill), you may email your instructor a scanned copy of the completed activity for credit. This must be received by **8pm Mountain Time on the day the activity would be checked in class**.
- The lowest activity grade will be dropped.

Labs (15%)

Every Friday, you will meet with your classmates and instructor to work through that day's coursepack Rstudio group lab. The lab will reinforce the ideas learned in the activities completed Monday and Wednesday but with the use of Rstudio for exploring and analyzing data.

- Each group will turn in the completed lab to Gradescope. Labs are due **Friday at 8pm Mountain Time each week**.
- The lowest lab grade will be dropped.

Assignments (15%)

You will complete weekly assignments in Gradescope. These should be completed individually (meaning all answers should be written in your own words), but you may use your classmates, tutors, or your instructor/co-instructor/TA for assistance.

- Weekly assignments are due **Monday at 8pm Mountain Time each week, covering the previous week's content**.
- The lowest assignment grade will be dropped.

Midterm exams (30%)

There will be two midterm exams (worth 15% of the course grade each). Midterm exams will be taken in class during your normal in-class time. Each exam has an individual (Wednesday) and group (Friday) component. A practice exam will be released in D2L two weeks prior to the exam, with solutions to the practice exam released in D2L one week prior to the exam. Further details, resources, and instructions for each exam will be posted the week prior to the exam in D2L.

***Individual portion*:** Individual midterm exam 1 will be **September 29th**; Individual midterm exam 2 will be **November 3rd**.

- Individual portions of the midterms will be worth 80% of your midterm exam grade.
- Potential individual midterm exam questions will be released one week prior to the exam. All exam questions will be selected from this set.
- On the exam day, you will be given a randomly chosen subset of the previously released potential exam questions for your exam.
- Individual midterm exams are closed book, closed notes.
- A formula sheet will be provided to use during the exam (also released with the potential midterm exam questions).
- You will be allowed a calculator on the individual midterm exams.
- You will **not** be required to use Rstudio on the invdividual midterm exams.

***Group portion*:** Group midterm exam 1 will be **October 1st**; Group midterm exam 2 will be **November 5th**.

- Group portions of the midterms are worth 20% of your midterm exam grade.
- Group midterm exams are open book, open notes.
- You will be allowed a calculator on the group midterm exams.
- You **will** be required to use Rstudio on the group midterm exams.

Final exam (20%)

The group final exam will be taken in class during your normal in-class time. A practice exam will be released in D2L one week prior to the exam, with solutions to the practice exam released in D2L the Sunday prior to the exam. Further details, resources, and instructions for each exam will be posted the week prior to the exam in D2L.

***Individual portion*:** Individual final exam will be **December 16th, 6 - 7:50pm**

- The individual portion of the final exam will be worth 80% of your exam grade.
- No potential final exam questions will be released.
- The individual final exam is closed book.
- You will be allowed to create a one page note sheet for the exam. You will also be provided a one page formula sheet during the exam.
- You will be allowed a calculator on the individual final exam.
- You will **not** be required to use Rstudio on the individual final exams.

***Group portion*:** Group final exam will be **December 10th (during normal class time)**.

- The group portion of the final exam will be worth 20% of your exam grade.
- The group final exams is open book, open notes.
- You will be allowed a calculator on the group final exam.
- You **will** be required to use Rstudio on the group final exam.

Letter grades

Final course grades will be determined according to the following scale.

Letter Grade	Weighted Score
A	93-100%
A-	90-92.99%
B+	87-89.99%
B	83-86.99%
B-	80-82.99%
C+	77-79.99%
C	73-76.99%
C-	70-72.99%
D	60-69.99%
F	<59.99%

The grade cutoffs may be shifted *downward* at the end of the semester based on student performance (never upward).

Late work policies

- **Videos**: You may take the in-video quizzes as many times as you like up until the due date — the most recent quiz score will be the recorded grade for that video in D2L. Videos are available in D2L at least one week prior to the due date, so extensions on these quizzes are not given unless for extenuating circumstances that prevent the student from viewing the video for that entire period.
- **Activities and Labs**: Attendance in this course is critical for success and is therefore required. The in-class activity and lab grades are a proxy for attendance and engagement. Students are expected to be in class during in-class activities and labs to provide support to each other and their teammates while working through the material. If you need to miss a class period due to illness, quarantine, or other extenuating circumstances, please email your instructor a picture or scan of your completed activity due that day by 8pm Mountain Time, and we can give you credit for your completed activity. If the activity is not received by 8pm Mountain Time on the day it is due, you will not receive credit unless for extenuating circumstances that prevented you from completing the activity for the entire week prior to the due date. If you need to miss a lab due to illness, quarantine, or other extenuating circumstances, please email your instructor and group-mates letting them know **prior to the lab meeting**. You may participate in the lab via video conferencing if desired or you may complete the lab on your own. If the latter, your instructor will determine an appropriate extension on the lab based on your individual circumstances.
- **Exams**:

- Students that are in quarantine but healthy enough to take the exam should email Student Success Coordinator Jade Schmidt to arrange to take the exam at home while being proctored via Zoom.
- If you are ill to the point of not being able to take the exam, please email Student Success Coordinator Jade Schmidt to arrange a time to take the exam remotely via Zoom when you are feeling better within the week of the exam.
- Students who miss the exam without contacting the instructor prior to the exam will receive a zero on the exam.
- Work is not a legitimate reason for an exam absence.

COVID-19 policies and health-related class absences

Montana State University strongly recommends students, faculty and staff wear face masks in indoor public spaces, in accordance with the Centers for Disease Control recommendations. Montana State University encourages students, faculty and staff to take advantage of convenient, on-campus clinics for the COVID-19 vaccine. Schedule your appointment by going to www.montana.edu/health/coronavirus.

Please evaluate your own health status regularly and refrain from attending class and other on-campus events if you are ill. MSU students who miss class due to illness will be given opportunities to access course materials online. You are encouraged to seek appropriate medical attention for treatment of illness. In the event of contagious illness, please do not come to class or to campus to turn in work. Instead notify us by email about your absence as soon as practical, so that accommodations can be made. Please note that documentation (a Doctor's note) for medical excuses is not required. MSU University Health Partners–as part their commitment to maintain patient confidentiality, to encourage more appropriate use of healthcare resources, and to support meaningful dialogue between instructors and students–does not provide such documentation.

Diversity and inclusivity

Respect for Diversity: It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexual orientation, disability, age, socioeconomic status, ethnicity, race, religion, culture, perspective, and other background characteristics. Your suggestions about how to improve the value of diversity in this course are encouraged and appreciated. Please let us know ways to improve the effectiveness of the course for you personally or for other students or student groups.

In addition, in scheduling exams, we have attempted to avoid conflicts with major religious holidays. If, however, we have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let us know as soon as possible so that we can make other arrangements.

Support for Inclusivity: We support an inclusive learning environment where diversity and individual differences are understood, respected, appreciated, and recognized as a source of strength. We expect that students, faculty, administrators and staff at MSU will respect differences and demonstrate diligence in understanding how other peoples' perspectives, behaviors, and worldviews may be different from their own.

Policy on academic misconduct

Students in an academic setting are responsible for approaching all assignments with rigor, integrity, and in compliance with the University Code of Student Conduct. This responsibility includes:

1. consulting and analyzing sources that are relevant to the topic of inquiry;
2. clearly acknowledging when they draw from the ideas or the phrasing of those sources in their own writing;
3. learning and using appropriate citation conventions within the field in which they are studying; and
4. asking their instructor for guidance when they are uncertain of how to acknowledge the contributions of others in their thinking and writing.

When students fail to adhere to these responsibilities, they may intentionally or unintentionally "use someone else's language, ideas, or other original (not common-knowledge) material without properly acknowledging its source" http://www.wpacouncil.org. When the act is intentional, the student has engaged in plagiarism.

Plagiarism is an act of academic misconduct, which carries with it consequences including, but not limited to, receiving a course grade of "F" and a report to the Office of the Dean of Students. Unfortunately, it is not always clear if the misuse of sources is intentional or unintentional, which means that you may be accused of plagiarism even if you do not intentionally plagiarize. If you have any questions regarding use and citation of sources in your academic writing, you are responsible for consulting with your instructor before the assignment due date. In addition, you can work with an MSU Writing Center tutor at any point in your writing process, including when you are integrating or citing sources. You can make an appointment and find citation resources at www.montana.edu/writingcenter.

In STAT 216, students involved in plagiarism on assignments (all parties involved) will receive a zero grade on that assignment. The second offense will result in a zero on that assignment, and the incident will be reported to the Dean of Students. Academic misconduct on an exam will result in a zero on that exam and will be reported to the Dean of Students, without exception.

More information about Academic Misconduct from the Dean of Students

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Policy on intellectual property

This syllabus, course lectures and presentations, and any course materials provided throughout this term are protected by U.S. copyright laws. Students enrolled in the course may use them for their own research and educational purposes. However, reproducing, selling or otherwise distributing these materials without written permission of the copyright owner is expressly prohibited, including providing materials to commercial platforms such as Chegg or CourseHero. Doing so may constitute a violation of U.S. copyright law as well as MSU's Code of Student Conduct.

More information about Academic Misconduct from the Dean of Students