

STAT 216: INTRODUCTION TO STATISTICS

UNIVERSITY OF MONTANA
SPRING, 2021

ABOUT THE COURSE

“Statistics” is often associated with a particular kind of mathematical *content* to be learned—vocabulary, symbols, formulas, etc. In this course, we will explore what it means to think about statistics as a way of *making sense of the world*.

LEARNING OUTCOMES

STAT 216 satisfies the general education mathematics literacy requirement. Upon successful completion of STAT 216, a student will be able to apply effectively statistical reasoning to a variety of applied or theoretical problems, including:

1. be able to describe distributions numerically, graphically, and verbally.
2. be able to use and interpret a linear model for the relationship between two variables
3. know the basic principles of good experimental design and good sampling design
4. know the fundamental ideas of statistical inference for means and proportions including both hypothesis testing and confidence intervals.
5. be able to interpret confidence intervals and p-values in the context of real problems.
6. be a critical consumer of statistical studies reported in the media.

QUICK LINKS

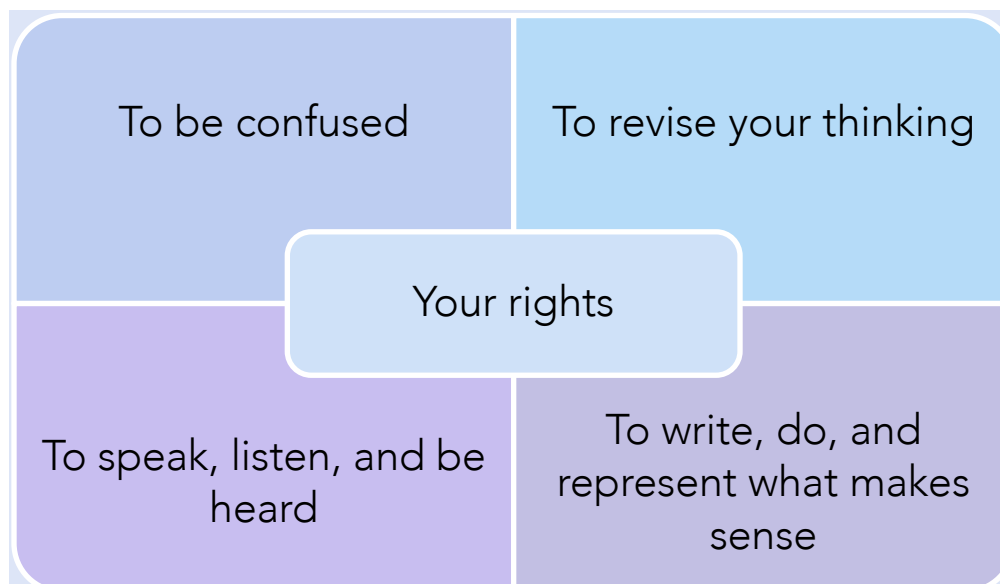
Textbook: https://bookdown.org/frederick_peck/textbook/

MWF 9am lectures: <https://umontana.zoom.us/j/91025993112?pwd=aXplUjY3K3ZDd0M3citqemc2cW9XZz09>

MWF 10am lectures: <https://umontana.zoom.us/j/93485541567?pwd=VmJpalNRcEhFUllaVW9iOUZKVHppQT09>

Th 9am recitation: <https://umontana.zoom.us/j/93600431635?pwd=Rmd0MExoSHdwTENhK3VudmllldlpKZz09>

Th 11am recitation: <https://umontana.zoom.us/j/96165853339?pwd=NTRTOXVIUUZwRE04K0pHeHB4TFJaZz09>



YOU HAVE THE RIGHT TO BE CONFUSED. Being confused is actually a good thing. Feeling confused is an important part of learning. If you are confused, don't try to hide it. Exercise your right! Say, "I don't understand this... yet."

YOU HAVE THE RIGHT TO REVISE YOUR THINKING. Nothing is set in stone. You may notice that you made a mistake. Claim it! You may get some feedback. Respond to it! Learning is a process and revision is an important part of that process.

YOU HAVE THE RIGHT TO SPEAK, LISTEN, AND BE HEARD. Learning and doing statistics is a social enterprise. We will offer multiple ways for you to communicate and collaborate with others.

YOU HAVE THE RIGHT TO DO ONLY WHAT MAKES SENSE. Math should make sense. If you find yourself doing something, but you can't really explain why, then claim your right and stop. Do what makes sense to you. This is not to say that anything goes. You may get some feedback which causes you to revise your thinking. This also means that you have the right to use words and symbols that make sense to you. We will introduce new vocabulary and symbols in this class, and we'll help you learn to use them. As you are learning, please use language that makes sense to you.¹

¹ These are based on work by Olga Torres (https://www.youtube.com/watch?v=_UndpNUCAqw) and Crystal Kalinec-Craig (<https://embracinglifewithmajorrevisions.org/rights-of-the-learner-blogs/>)

COURSE FORMAT AND MEETING TIMES

3 LECTURES/WEEK: MWF at 9am and 10am, via Zoom (see links below).

1 RECITATION/LAB SECTION PER WEEK: Thursday at the times listed below.

Education researchers have spent decades studying how people learn math and statistics. The research is clear: **we learn more when we are actively engaged than when we are passively listening to a lecture.** Therefore, lectures and recitations will involve “active learning” including activities and discussion.

Attendance is mandatory in lectures and recitation sessions. Please make sure that you are able to fully participate in live, interactive sessions.

You can find the lecture and recitation section that you are registered for in CyberBear.

Type	Section	Instructor	Time and location	Location
Lecture	R10	Caleb Huber	MWF 9:00 – 9:50	Remote (see zoom link below)
Lecture	R00	Fred Peck	MWF 10:00 – 10:50	Remote (see zoom link below)
Recitation	01	Ryan Wood	Th 8:00 – 8:50	MLIB 410
Recitation	02	Ryan Wood	Th 9:00 – 9:50	MLIB 410
Recitation	03	Ryan Wood	Th 10:00 – 10:50	MLIB 410
Recitation	R04	Caleb Huber	Th 11:00 – 11:50	Remote (see zoom link below)
Recitation	05	Ian Derickson	Th 12:00 – 12:50	MLIB 410
Recitation	R11	Riley Watt	Th 9:00 – 9:50	Remote (see zoom link below)
Recitation	12	Riley Watt	Th 10:00 – 10:50	UH 210
Recitation	13	Ian Derickson	Th 11:00 – 11:50	MLIB 410
Recitation	14	Riley Watt	Th 12:00 – 12:50	Stone 304
Recitation	15	Ian Derickson	Th 1:00 – 1:50	GBB 123

ZOOM LINKS



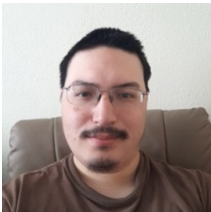


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MWF 10am lectures: <https://umontana.zoom.us/j/93485541567?pwd=VmJpalNRcEhFUllaVW9iOUZKvHppQT09>

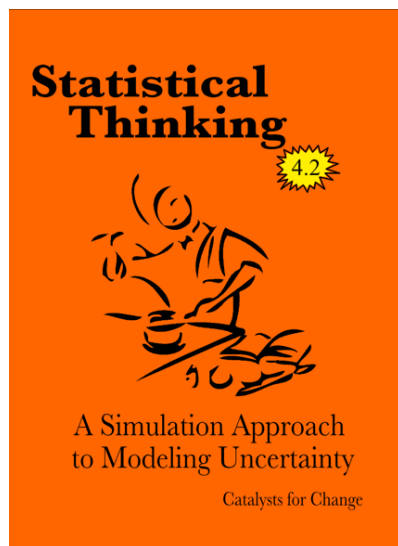
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Th 11am recitation: <https://umontana.zoom.us/j/96165853339?pwd=NTRTOXVIUUZwRE04K0pHeHB4TFJaZz09>

PEOPLE: INSTRUCTORS, CONTACT INFORMATION, OFFICE HOURS

<p>Fred Peck (he/him)</p> 	<p>Sections: Course coordinator, Lecture R00</p> <p>Contact: frederick.peck@umontana.edu</p> <p>Office hours:</p> <ul style="list-style-type: none"> MWF 11:00 – 12:00 via zoom: https://umontana.zoom.us/j/93485541567?pwd=VmJpalNRcEhFUllaVW9iOUZKVHppOT09 We can meet anytime. Schedule at www.fapeck.com/meeting
<p>Caleb Huber (he/him)</p> 	<p>Sections: Lecture R10, Recitation R04</p> <p>Contact: caleb2.huber@umontana.edu</p> <p>Office hours:</p> <ul style="list-style-type: none"> MW 4-5 pm via Zoom: https://umontana.zoom.us/j/98062395557 Or setup an appointment by email: caleb2.huber@umontana.edu
<p>Ian Derickson (he/him)</p> 	<p>Sections: Recitations 05, 13, 15</p> <p>Contact: ian.derickson@umontana.edu</p> <p>Office hours:</p> <ul style="list-style-type: none"> MF 12-1 via zoom: https://umontana.zoom.us/j/96491180507?pwd=Qk5URXpLWG5wSUtoZGRUcGFCZ2hVZz09 Or set up an appointment by email: ian.derickson@umontana.edu
<p>Riley Watt (he/him)</p> 	<p>Sections: Recitations R11, 12, 14</p> <p>Contact: riley.watt@umontana.edu</p> <p>Office hours:</p> <ul style="list-style-type: none"> Wed, 12-1 via Zoom: https://umontana.zoom.us/j/92651826941 Or set up an appointment by email: riley.watt@umontana.edu
<p>Ryan Wood (he/him)</p> 	<p>Sections: Recitations 02, 03, 04</p> <p>Contact: ryan2.wood@umontana.edu</p> <p>Office hours:</p> <ul style="list-style-type: none"> Tues 12-1 via Zoom: https://umontana.zoom.us/j/95290649010. Or set up an appointment by email: ryan2.wood@umontana.edu

TEXTBOOK



We will use a customized version of the book, *Statistical Thinking: A simulation approach to modeling uncertainty*.

The book is available for free at:

https://bookdown.org/frederick_peck/textbook/

SOFTWARE

We will use the following software and websites:

- TinkerPlots: We will use TinkerPlots for all of our statistical analysis. **You will need to buy a copy of this software.** You can buy a 1-year license for \$7 or a “never expires” license for \$20. Download and buy at: <http://www.tinkerplots.com>. (TinkerPlots is also installed in the 2nd-floor computer lab in the Math building.)
- Zoom: We will use Zoom for lectures and remote recitation sections. Please be sure that you have the most recent version of Zoom installed. Download at <https://zoom.us/download>
- Moodle: <http://moodle.umt.edu> We will use Moodle as our “central meeting place.” Assignments, data sets, handouts, etc. will be posted there. Please plan to check the Moodle site often.
- Desmos: <https://student.desmos.com> Most in-class activities will be done through Desmos. We’ll provide access and usage instructions in class.

A NOTE ABOUT COMPUTERS AND TECHNOLOGY:

You will need access to a computer to attend the lectures, access readings, and engage with statistical software. We recognize that some students are unable to afford the cost of purchasing a computer. We also recognize that technology problems can be a significant source of stress for students. We want to help. **Please contact Fred if you have a challenge accessing a computer.** That way we can help you access support.

COURSE ACTIVITIES AND DELIVERABLES



READINGS: Occasionally we will have readings from the textbook. Readings should be completed before the class for which they are assigned.



IN-CLASS ACTIVITIES AND DISCUSSION: Education researchers have spent decades studying how people learn math and statistics. The research is clear: **we learn more when we are actively engaged than when we are passively listening to a lecture.** Therefore, lectures and recitations will involve “active learning” including activities and discussion.

- We do not expect that you will “know” how to do every activity. In many cases, you won’t! That’s because we will often ask you to engage in activities in order to learn something new.
- We do expect that you will engage deeply and thoughtfully in class activities, and that you exercise all of your rights as a learner.



PRACTICE, EXTENSION, AND PREPARATION (PEP) ACTIVITIES: PEP activities are done outside of class. You can work together on the PEP activities and use any resources that are helpful.

PPE activities are basically a sandbox: a place for you to try things out and see how they work. They are not graded for accuracy, only effort. The key is to try things out and to learn from your experience.

In order for PEP activities to contribute to your learning:

- *You have to engage thoughtfully with every problem.* Some problems may be challenging! You may be confused! That’s okay! Remember, you have the right to be confused. The activities are a sandbox, a place to play. They are not an evaluation.
- *You have to get some feedback.* We will post *instructor solutions* for each set of PEP activities. To get feedback, you will correct your own assignments, including making notes to yourself.
- *You have to get help.* If, after getting feedback, you are still confused about something, congratulations! This is a very important part of learning. They key is that, when you are confused, you seek help. You can get help from any instructor. Office hours are posted on Moodle.

PEP activities are assigned on Fridays, and corrected responses are due at midnight the following Wednesday. Please submit your corrected responses to Moodle on Weds. nights, and bring a copy to your recitation sections on Thursday.



CHECK-INS: Each Friday, we will have online check-ins. The point of a check-in is to give you and us feedback on your participation and on how you are understanding the concepts that week.

- You can use any resources you want on your check-ins, but you should please complete them by yourself.



STATISTICAL INVESTIGATIONS: Investigations are the primary means by which we will assess your statistical reasoning. There are five statistical investigations, one for each unit. The investigations are due on the Wednesday after the end of the unit ends (there will not be any PEP activities that week). We will provide more information about investigations later in the course.

- **You may use any resources, including other people,** to help you with your investigations.
- Remember, you have the right to revise your thinking. **You may revise and resubmit your investigations for full credit, based on feedback.**

GRADING

You grade is based on the following:

- Participation in course activities (50%)
 - Attendance and participation in lectures and recitations (20%)
 - Thoughtful completion of PEP activities (30%)
- Content (50%):
 - Check-ins (5%)
 - Investigations (45%)

Letter grades will be assigned based on the standard 90-80-70 scale. Because you have the right to revise, your grade is literally in your hands.

HELP!

HELP WITH COURSE CONTENT: Confusion is part of learning. The key is not to avoid confusion, but to embrace it, and to get help.

We are here to help!

The best way to get help in this course is to meet with an instructor. You can attend the office hours of any of the instructors. Up-to-date office hours are posted on Moodle. You can also schedule a meeting with any instructor at a time that is convenient for you.

You can ask any of us for help, and attend any of our office hours!

HELP WITH ONLINE LEARNING:

- For help with Zoom: Contact the IT Help Desk at 406-243-HELP or ithelpdesk@umontana.edu. Hours are 8AM-5PM, M-F.
- For help with Moodle: Contact the UOnline Help Desk at 406-243-4999 or 866-225-1641 (toll-free) or uonline-help@umontana.edu. Hours are 8AM-5PM, M-F.

OTHER POLICIES

COMMUNICATING: Email is the best way to reach your instructors. UM policy states that we must use your UM email account when we correspond with you. Please email us from your UM account—that makes it easy to follow the policy! Even if you don't, we still have to reply to your UM account.

CLASSROOM AND TESTING ACCOMMODATIONS: The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

ACADEMIC HONESTY: All students need to be familiar with the Student Conduct Code. You can find it in the "A to Z Index" on the UM home page. All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

CULTURAL, FAMILY, AND HEALTH LEAVE: Please know that we understand that you are a human and that you have a life and responsibilities outside of this course. We will work with you to make sure that you can participate in or attend to any out of class responsibility you have.

FOOD AND HOUSING INSECURITY: Any student who faces challenges securing food or housing, and believes that this could affect their performance in this course, is urged to contact any or all of the following campuses resources:

Food Pantry Program: UM offers a food pantry that students can access for emergency food. The pantry is open on Tuesdays from 12 to 5 PM and Fridays from 10 AM to 5 PM. The pantry is located in UC 119 (in the former ASUM Childcare offices). Pantry staff operate several satellite food cupboards on campus (including one at Missoula College). For more information about this program, email umpantry@mso.umt.edu, visit the UM Food Pantry website (www.umt.edu/pantry) or contact the pantry on social media (@pantryUm on twitter, @UMPantry on Facebook, um_pantry on Instagram).

ASUM Renter Center: The Renter Center has compiled a list of resources (<https://medium.com/griz-renter-blog>) for UM students at risk of homelessness or food insecurity. Students can schedule an appointment with Renter Center staff to discuss their situation and receive information, support, and referrals.

TRiO Student Support Services: TRiO serves UM students who are low-income, first-generation college students or have documented disabilities. TRiO services include a textbook loan program, scholarships and financial aid help, academic advising, coaching, and tutoring. Students can check their eligibility (www.umt.edu/trioss/apply.php) for TRiO services online. If you are comfortable, please come see members of the teaching team. We will do our best to help connect you with additional resources.

OUR COLLECTIVE RESPONSIBILITY TO PROMOTE PUBLIC HEALTH

We are experiencing a global pandemic. We are called upon to engage in practices to promote collective wellbeing and public health.

- Mask use is required within the classroom. View UM's face covering policy: <https://www.umt.edu/coronavirus/mask-policy.php>
- We have all been provided with a Healthy Griz kit. Everyone is expected to clean their personal work space when they arrive for class, and again before they leave the classroom.
- Refill stations for cleaning supplies/hand sanitizer will be set up around campus - please learn where they are and use them.
- Please try not to congregate outside the classroom before and after class.
- Unless there is a health rationale, drinking and eating food (which requires mask removal) is not allowed within the classroom.
- Stay home and contact the Curry Health Center at (406) 243-4330 if you feel sick and/or if exhibiting COVID-19 symptoms.
- If you are diagnosed with COVID-19, follow instructions for quarantine and contact your advisor so they can help you stay on track academically.
- Please remain vigilant outside the classroom and help mitigate the spread of COVID-19.
- You can find up-to-date information on the UM coronavirus website: <https://www.umt.edu/coronavirus>

Let's all care for each other.

A FINAL NOTE: THE IMPORTANCE OF OUR COLLECTIVE WELLBEING

This is a challenging and uncertain time for all of us. Even as we gather together to learn statistics, our priority is our collective wellbeing. Please act gracefully and patiently with each other. We may experience sudden changes. We will have to face these changes with grace, understanding, and flexibility. If you experience life challenges that get in the way of your participation in the class, please let us know. We promise to be understanding and to work with you. Again, our priority is your physical and emotional health.