Welcome to the Applied Statistics Syllabus! Select anything, right-click, and choose "Comment" to leave a comment or question.

Applied Statistics (MATH 1700), Spring 2022

Instructor: Dr. Jessie Oehrlein – call me **Dr. Oehrlein** (or-line) **or Dr. O!** I use **she/her** pronouns.

What is this class?

Course description: Our society is generating an increasing amount of data, and there are many questions we would like to use that data to answer. Who will win an election? What should an athlete focus on to improve? What are the biases in a particular process? How do businesses use survey results to make decisions? Does a new medical treatment work? Statistics is the science that allows us to make sense of data and tackle a wide variety of topics like these. This course focuses on the key tools you need to understand and use the quantitative information around us to answer real questions.

What will class be like?: We will spend class time exploring statistics concepts and tools and using those tools to answer questions, often with real data. This will happen in small-group work, full-class discussions, or mini lectures. We'll often explore data with technology, so **please bring a laptop!** There will also be time in class to discuss news articles that draw on the statistics topics we study.

I want to know more about:

Key Information

Class meetings

33585: MW 8-9:15 AM, PERC 103
F 8-8:50 AM, CNIC 341

33768: MW 11 AM-12:15 PM, EDG 106
F 11-11:50 AM, PERC 108

Student Hours
Edgerly 301E: T 9:30-10:45, F 9-10:45 AM

These are times when I am available specifically to work with you. Please come by if you have questions, concerns, insights, or to say hello!

You can also stop by anytime my door is open, or set up an individual meeting here. I am also always happy to answer questions by email.

How to contact me

Email: joehrlei@fitchburgstate.edu
Office: Edgerly Hall 301E

Be sure to read my email responses policy.

Textbook and Materials

Introductory Statistics by Illowsky & Dean here (online, downloadable as a PDF, or you can order a physical copy if you prefer).

Course goals

Learning goals: There are **three overarching learning goals** for this course, each of which touches upon different aspects of statistics like describing data sets, visualizing data, designing statistical studies, and analyzing data. Below are the three overarching learning goals and some explanation of why these might be relevant to your life and work.

Upon completing this course, you will be able to…

- **Critically evaluate uses of statistics and statistical arguments.** You will encounter statistics in many places in the world, sometimes used or presented well and honestly, and sometimes used or presented poorly or in misleading ways.
- **Make and share decisions based on statistical analyses.** When you encounter quantitative information, you may need to make decisions based on it, and you will often need to share those decisions with others.
- **Perform some key statistical analyses.** In addition to consuming statistical work done by others, you may need to work with quantitative data yourself. Different fields emphasize different statistical approaches and use different tools, but this class will give you a taste of some common ways of analyzing data.

This course satisfies the Quantitative Reasoning outcome in the General Education curriculum.

What assessments will there be?

The main idea of assessment in this course is communication and feedback. There are several different types of assessments or assignments in this class, but they will all allow you to check your own understanding and progress towards the learning goals, get in-depth feedback from me, and let me know where to spend more time or approach something differently.

Each one is described briefly here. See **"How do I earn a grade?"** for an explanation of how these contribute to your final grade. Our class schedule with topics and assessments is here.

- **Daily surveys (before each class period):** You will summarize key ideas and ask questions from the last class period and from readings/videos between classes. These will help me shape group/class activities and discussions. These are due at **11:59 pm the day before class** (Sunday, Tuesday, Thursday). The surveys themselves will take **5-10 minutes to complete,** but you should expect to spend **15-20 minutes** on readings/videos before completing the survey. These are **graded on completion.**
- **Homework (weekly):** This is your out-of-class practice of the material we discuss in-class. You will describe what work you've done between classes on the recommended homework problems, give solutions to selected required problems, and describe how confident you feel about the homework overall. Homework is due **at 11:59 pm on Sunday night**. You should expect to spend **2-3 hours** per week on homework. This is **graded on completion.**
- **Article reading assignments (every 2 - 3 weeks):** To see and discuss how statistics is actually used, you will choose an article from a short list of possibilities, read it outside of class, and we will then discuss the articles in class. For some of these assignments, you will then write/record reactions to the article and the class discussion. Those write-ups will be graded as satisfactory (S) or not yet satisfactory (N) based on a rubric, with the opportunity for revision. There will be 5 article reading assignments.
- **Learning target checkpoints (every 3-4 weeks):** We will periodically have checkpoints over the learning targets that describe the key goals for your learning in this course. You will have multiple opportunities to demonstrate your understanding of the major objectives in our class, without penalty for needing multiple attempts. These will occur **outside of class** and will be available for approximately a week. There will be 4 checkpoints. There will also be an **optional final exam** as a last chance to meet learning targets.
- **Statistical Analysis Projects (throughout the semester):** There will be 3 projects involving statistical analysis with real datasets. You will work on each of these over the course of several weeks, and they will be graded as satisfactory (S) or not yet satisfactory (N) based on a rubric, with the opportunity for revision.
- **Midterm & Final Reflections:** These will be reflections (in written, video, or audio form) on the course and your learning. I will also periodically ask you to update them to track your grade and progress on the course. These will be graded as satisfactory (S) or not satisfactory (N) based on a rubric.

How do I earn a grade?

Learning doesn't happen immediately. We often need to revisit and reflect on ideas in order to learn them well. In this class, your final grade will reflect how well you *eventually understand* each topic. You can make mistakes without penalty, get feedback, and try again.

Your grade is based on completing a specific list of requirements. Weekly homework and daily reflection surveys are based on completion. Projects, reading assignments, and reflections will be graded as satisfactory (S) or not yet satisfactory (N) based on rubrics. Checkpoints are based on completing **learning targets listed here** that describe the major ideas of the course. Your grade on each question of a checkpoint will either be satisfactory (S), not yet satisfactory (N), or not attempted (NA). If you earn an N, you can try again on the next checkpoint, or you can **reassess.**

Reassessments are an important way to demonstrate your learning and meet targets by reflecting and acting on the feedback you received. A reassessment is a 15-minute meeting with me outside of class to do a new problem on that learning target, either in written form (like the checkpoint) or orally. You may do this **at most once per week**. Before doing a reassessment, you must correct and reflect on your error on the original problem, using the structure in this document. Schedule the meeting by making an appointment here. In the additional information text box, include a link to a Google Doc with your revision and reflection, and state whether you would like to do the reassessment in a written or oral format.

How your final grade is determined: Your final grade will be based on the criteria you fully satisfy in the list below. If you **fully** satisfy the requirements of a particular grade, you will have **at least** that grade. If you fulfill some but not all requirements of a particular grade but all the requirements of the grade below it, you will have some grade in between the two (+, +/-, -).

To earn a 1.0 (D), do *all* of these:

- Earn a Satisfactory on 3 learning targets OR 1 project.

To earn a 2.0 (C), do *all* of these:

- Regularly complete daily surveys & homework assignments.
- Learning targets: Earn a Satisfactory on 4 targets.
- Article reading: Earn a Satisfactory on 1 write-up.
- Projects: Earn a Satisfactory on 1 project.
- Reflections: Earn a Satisfactory on the Midterm or Final Reflection.

To earn a 3.0 (B), do *all* of these:

- Regularly complete daily surveys & homework assignments.
- Learning targets: Earn a Satisfactory on 5 targets.
- Article reading: Earn a Satisfactory on 2 write-ups.
- Projects: Earn a Satisfactory/Partially Sat/Minor Revision on 2 projects.
- Reflections: Earn a Satisfactory on the Final Reflection.

To earn a 4.0 (A), do *all* of these:

- Regularly complete daily surveys & homework assignments.
- Learning targets: Earn a Satisfactory on 7 targets.

- Article reading: Earn a Satisfactory on 3 write-ups.
- Projects: Earn a Satisfactory/Partially Sat/Minor Revision on 3 projects.
- Reflections: Earn a Satisfactory on the Midterm and Final Reflections.

I will set **+, +/-**, and - grades based on how close you are to the next higher (or lower) letter grade. For example, if you meet all criteria for an A except for one article reading write-up, that may be an A-. You will also have the opportunity on your final reflection to explain, with evidence, what grade you think reflects your learning in the course.

Classroom Community and Policies

Expectations

At this link are the guidelines and aspirations y'all developed for interacting with each other in small teams or full-class discussions this semester.

In line with this, you can expect me to work with you patiently as you learn, to be available to help you, to give feedback on your work, to listen to and act on your feedback about the course.

Well-being, Access, and Accommodations[1]

I am committed to building a learning environment with you in which all students can participate fully and succeed. My goal is to provide a variety of experiences and resources so that everyone has access to course content. Statistics is a human activity, and I aim to foster an environment that always recognizes your humanity and the inherent value in your ways of knowing, doing, and communicating.

If you have any access needs that I can better support by changing some aspect of my teaching, class procedures, or class culture, please let me know! Even if you aren't sure exactly what you need, that's a conversation I want to have with you. That can be in person (in public or private), over video/voice call, through a chat, or via email. Please talk to me if you need accommodations for your disabilities. I honor self-diagnosis, and I want this course to be as accessible as possible.

Disabled students may also officially register with Disability Services; more information is available on the Disability Services site (link).

If you are responsible for childcare on short notice, you are welcome to bring children to class with you. If you are a lactating parent, you may take breaks to feed your infant or express milk as needed. If I can support you in navigating parenting, coursework, and other obligations in any way, please let me know.

Your well-being is of utmost importance. If you are facing challenges to your mental/physical health or obstacles like food or housing insecurity, please don't hesitate to let me know so that we can find appropriate resources. For example, the Falcon Bazaar Necessities and Food Pantry is in Hammond G-15; more information is available at this link. And please do contact me if you have questions or concerns about the course, whether about content, format, or expectations. Together we can build a supportive learning community and environment where you can be successful.

Integrity and Respect[2]

Academic honesty: Statistics as a discipline involves both individual and collaborative work, and this course incorporates both. I expect you to honestly represent your own learning and

[1] Some language borrowed or adapted from Drs. Lydia X. Z. Brown, Melissa Cheyney, and Aunchalee Palmquist.
[2] Some language borrowed or adapted from Drs. Joshua Bowman, Spencer Bagley, David Clark, and Matt Boelkins.

work. Here's what that looks like for the different types of assignments or assessments in this course:

- **Daily surveys:** These should be your own summaries of the material, your own questions, and honest assessments of your understanding.
- **Homework:** On homework problems, you may work with other students in the course, may get help from me, tutors in the Tutor Center, and peers, and may look at resources for guidance. However, any solutions you submit should be in your own words and reflect your own understanding, and you should acknowledge your collaborators and anyone or any resource that helped you.
- **Learning target checkpoints and reassessments:** You can reference notes or the book, but you must complete these questions individually. For the revisions prior to reassessments, you may seek help, but as with homework, the solutions and reflections you submit should be in your own words, and you should acknowledge all help you received.
- **Projects:** As with homework, you may work with peers, receive help from me, tutors in the Tutor Center, or peers, and refer to outside resources, but the work you submit must be your own analyses and explanations. You should again credit those you worked with and the help you received.
- **Reading Assignment Write-ups and Midterm/Final Reflections:** These should be your own writing reflecting on class discussions or the course as a whole. You may discuss with others, but the ideas and writing should be your own; these are meant to be mostly-independent reflections.

This course is subject to the official Fitchburg State University guidelines in the Student Handbook.

Respect: Significant portions of this course involve group work and discussion in class. Some discussions will touch on sensitive topics. **So that everyone feels comfortable participating in these activities, we must listen to each other and treat each other with respect. Early in the course, we'll develop norms for these activities as a community.** Diversity and individual differences are a source of strength in this classroom and community. Any attitude that one group of people is superior to another is not welcome here. One of the greatest failures of statistics, historically and in the present, has been exclusion of voices from the field. **Everyone here can learn from each other, and doing so is vital to the structure of the course.**

Attendance, Extensions, and Technology

Attendance: While attendance is not required, **class time gives you the best opportunities to engage with the material deeply alongside your classmates and the instructor**, so please attend when you can. If you know in advance that you will miss a class, please let me know. Otherwise, let me know as soon as possible. I do not need details about why you will be/were absent. I just want to work with you to make a plan that keeps your learning in the course moving forward.

Extensions: You are always allowed to ask for an extension on an assignment by completing this form (link). In most cases, I will grant such a request, and together we'll decide on a new deadline. This will generally be a date that you think is fair and feasible for you to complete the

assignment. Keep in mind that I cannot take assignments after the end of finals week.

Technology: You are allowed to use technology in the classroom. In fact, we will often do so as part of in-class activities. Outside of those cases, I ask the following to avoid disturbing other students: that devices be on silent or vibrate-only during class, and that you step out of the room to make or take phone calls.

Getting Help

Student hours: Student hours are when I'm available to work specifically with you! The times are listed here. Please come if you have questions, but also come by if you want some dedicated time and space to work on statistics or if you just want to chat, say hi, or play with some puzzles.

Other meetings: If you can't make it to student hours or need to meet with me more privately, you can make an appointment by emailing me at joehrlei@fitchburgstate.edu or booking an appointment through https://calendly.com/joehrlei.

Tutor Center: The Tutor Center (link) in Hammond 306 has dedicated times to get help with MATH 1700. This course also includes a lot of writing, so you may find the writing tutors helpful, as well.

Email: I do my best to reply to emails promptly and helpfully. However, I receive a *lot* of email. To help both you and me, here are some specific expectations about emails:

- Please tell me what course and section (by time or number) you are in!
- If you email me between 7:00 am and 6:00 pm, I'll reply to you on the *same* day.
- If you email me in the evening or overnight (after 6:00 pm), I will reply to you by the *next* day.
- If your question is much easier to discuss face-to-face, I may ask you to meet with me in my office or on Google Meet (at a time that works for both of us) rather than answering directly in an email.
- Include any relevant photos/screenshots, PDFs, or links if possible.