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

Math Seminar (MATH 3900), Spring 2023

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

What is this class?

Course description: The focus of this seminar this semester will be time series analysis! A time series is data about a variable over time, and this type of data is used for forecasting or prediction across a wide variety of fields. We'll look at the kinds of features we care about in analyzing time series and then some methods for prediction.

What will class be like?: In class, we'll look at new concepts and start working through them, often doing problem-solving in groups. There will also be some discussion of problems you worked on over the past week.

I want to know more about:

Key Information

Class meetings
35936: F 11-11:50 AM, THOM 206

Student Hours
Edgerly 301E: R 2-3:15 PM, F 12:30-3:15 PM

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
Forecasting: Principles and Practice, available online for free!
We'll also be working in R, so you'll either need to download R and RStudio or set up an account in Posit Cloud. More about this on day one!

Course goals

Learning goals: There are **three overarching learning goals** for this course, each of which touches upon different aspects of your learning of statistical and mathematical content and skills. Through this course you will…

- **Study and make predictions about data related to time using features such as autocorrelation, seasonality, trends, and moving averages.**

  This is the statistical content of the course! We'll build up from what a time series is to a type of model known as an ARIMA model, a really flexible tool for forecasting.

- **Interpret notation, definitions, and statements in the process of reading and doing mathematical and statistical modeling.**

  We will be working with new notation and reading descriptions of statistical models, which can be tricky to parse. So we'll focus on approaches to doing that well.

- **Explain statistical analyses and models in symbolic, written, oral, and visual forms.**

  The most transferable part of this class, regardless of whether you go on to do more data analysis, is mathematical/statistical communication and moving across different representations of these ideas.

What assessments will there be?

The main goal of assessment in this course is inquiry, communication, and feedback. The different assessments will allow you to explore ideas in statistics, communicate with others about them, and be in conversation with me about your understanding.

Each one is described briefly here. See **"How do I earn a grade?"** for an explanation of how these contribute to your final grade.

- **Weekly surveys:** On weekly surveys, you will summarize key ideas and let me know how things are going (both in general and on the homework in particular). These are due on Thursday nights. The surveys themselves will take 5-10 minutes to complete.
- **Homework (weekly, first half of the semester):** This is weekly homework, focused on providing practice with ideas from class. It may involve doing analyses of your own or interpreting other analyses. It is due on Thursday nights.
- **Project:** In the latter half of the semester, you'll work on a project semi-independently analyzing time series data. This will be built up through a series of weekly assignments (replacing homework) and will culminate in a written report and oral presentation.

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 mainly reflect how well you *eventually understand and communicate* each topic. You can make mistakes, get feedback, and try again.

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 (+, +/-, -).

	D-level (1.0)	**C-level (2.0)**	**B-level (3.0)**	**A-level (4.0)**
Homework (✓+/✓/✓-)	Regular ✓- *or*	Regular ✓-	Regular ✓	Regular ✓+
Project Milestones		Regular ✓-	Regular ✓	Regular ✓+
Project Report & Presentation	Satisfactory report or presentation	Satisfactory report or presentation	Satisfactory report and presentation	Satisfactory report and presentation

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Classroom Community and Policies

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

[1] Some language borrowed or adapted from Drs. Lydia X. Z. Brown, Melissa Cheyney, and Aunchalee Palmquist.

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-23. (This is a new location!). 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: Mathematics as a discipline involves both individual and collaborative work, and this course incorporates both. I expect you to honestly represent your own learning and work. Here's what that looks like for the different types of assignments in this course:

- **Homework and Project:** You may work with others, use the textbooks and other sources, and talk to me, but your analyses should be in your own words and represent your understanding.
- **Weekly surveys:** These should represent your thinking on your progress in the course and thus should be completed individually and in your own words.

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. In particular, everyone will share mathematical ideas that will often not be fully polished. **So that everyone feels comfortable participating in these activities, we must listen to each other and treat each other with respect.** 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 homework or a project milestone by completing this form (link here). 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

[2] Some language borrowed or adapted from Drs. Joshua Bowman, Spencer Bagley, David Clark, and Matt Boelkins.

feasible for you to complete the assignment.

Technology: You are allowed to use technology in the classroom. In fact, we will sometimes 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 probability 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.

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:

- If you email me between 7:00 am and 5:00 pm on Monday through Friday, I'll reply to you on the *same* day.
- If you email me outside of those hours, I will reply to you by the *next* school 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.