This syllabus is subject to change with advance notice in the event of unforeseen circumstances and as needed, to best realize the educational goals of the course.

STAT 349-001/2 Introduction to Time Series
Fall 2022

INSTRUCTOR AND TEACHING ASSISTANT

Instructor
Panduan An, Ph.D.
Lecturer
1217A Medical Sciences Center
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Office hours: MW 1:00 pm - 2:00 pm or by appointment
Both in-person at 1217A MSC and online via Zoom Meeting ID: 943 2476 3019 Passcode: 478998

Teaching Assistant
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Office hours:
Tuesday 2:00 pm – 3:00 pm (Piazza)
Tuesday 3:00 pm – 4:00 pm (1217C Medical Sciences Center)
Friday 12:30 pm – 1:30 pm (1217C Medical Sciences Center)

Meeting Time and Location
LEC 001 MW 2:30 PM - 3:45 PM 19 Ingraham Hall

COURSE INFORMATION

Credit Hours Policy
The course credit hours, 3, are met by delivering two 75-minutes lectures weekly online throughout this semester. Students are expected to have a minimum of three hours of out of class work for each lecture over the fall semester course learning activities (reading, writing, homework, discussion, and preparation for exams, etc).

Course Description

Autocorrelation; stationarity and non-stationarity; heteroscedasticity; dynamic models; auto-regressive and moving average models; identification and fitting; forecasting; seasonal adjustment; applications for financial time series, social sciences and environmental studies.
Requisites
STAT 333, 340, graduate/professional standing, or declared in Statistics VISP

TEXTBOOK

I plan to cover the following chapters 1-12 in the textbook. If time allows, some sections from Chapters 13-15 may be covered.

HARDWARE AND SOFTWARE
- A laptop or a desktop is required.
- R software for statistical analysis will be used in class. R can be freely downloaded from http://www.r-project.org/. An R package called TSA has been specifically developed that implements almost all methods introduced in the textbook.

GRADING
The final course grades will be computed using the following weighted grading scheme:
- Homework Assignments 30%
- Midterm Exam 30%
- Final Exam 40%
- Final course grades will be curved.

EXAMS
There will be one (1) in-class midterm exam and a final exam. The dates of the exams are:

Midterm Exam: Wednesday, October 26 (in-class)
Final Exam: Wednesday, December 21 7:45 am - 9:45 am (location TBA)

- I will not re-schedule in-class exams for any reason other than recognized emergency situations. The final exam will not be rescheduled under any circumstances. Plan your semester accordingly!
- Exams are closed book. Students may bring one (1) 8.5” × 11” sheet of notes for the Midterm and two (2) 8.5” × 11” sheets for the Final.
- Calculator: you are allowed to bring a non-graphical and non-programmable, network-incapable scientific calculator. Other types of calculators are not allowed.
- The Final Exam will be cumulative.

HOMEWORK
Problem sets will be assigned weekly. Each assignment will consist of 6 to 8 problems. The following homework policies will be strictly enforced:
- In general, new homework assignments will be posted to Canvas on Tuesday morning. They will be due on the following Wednesday by 11:59 pm (midnight). There will be around 11 homework problem sets for the semester.
- The first homework will be assigned on Tuesday, September 13, 2022.
- Homework assignment is graded out of 100 points. Your homework will be graded based on organization, completeness, accuracy, and legibility. Three problems will be randomly selected
and graded based on accuracy and each worth 20 points. And the rest of the problem set will be graded based on completeness, organization, and legibility. Rubrics will be used for grading.

- Submit your homework in one pdf file electronically on Canvas by the due date and time.
- To receive full credit on homework problems, you must justify all your answers, showing supporting work and demonstrating sound, appropriate reasoning. Homework will be graded by the TA.
- Late homework will score 0.
- The lowest homework grade will be dropped before final grades are calculated.
- You are highly encouraged to discuss and help each other to solve homework problems. However, each student must turn in his or her own solutions independently—based on your own understanding, use your own words and work. Copying of homework, however, is absolutely forbidden and constitutes a violation of the Honor Code.

ATTENDANCE

Students are required to be present at the beginning of the semester and to remain until the work of the semester is completed (which includes final examinations). Note that any excused or unexcused absences may have a negative impact on a student's final grade in a course. It is expected that students provide adequate and reasonable advance notice to the instructor in order that they can ensure that an accommodation, if granted. Instructor may consider to accommodate students should an acceptable documented emergency occur, their university-endorsed extracurricular activities conflict with class attendance requirements, or other situations at the instructor's discretion. Students are responsible for all the information and materials presented during the class. Students should be mindful of class attendance policies and make sure they completely understand the ramifications of missing classes (either excused or unexcused).

COMMUNICATION

Outside of lecture, I may make periodic announcements to the class via the Canvas Inbox or university-supplied classlist as alternative. It is imperative that you make sure your @wisc.edu email address is working. Students have the responsibility to recognize that certain communications are time-critical. I will use Canvas as the course website. All homework assignments and any other pertinent materials will be posted there, as well as your grades.

For urgent issues or in case of an emergence, the best practice is to send an email to the instructor’s university email account. Please keep in mind that I receive a great deal of e-mail from many sources, make sure that you start your subject heading with the course number and then the specific topic of the email when you send emails to your instructor’s university email account. Failing to start your heading with the course name might send your e-mail to the spam folder.

Please allow 24-48 hours for a reply, excluding weekends. Students should not expect the instructor or TA to answer late night questions or reply late night emails if students ask or email the instructor or the TA the night before the assignment due or the night before the exams.

NETIQUETTE on Piazza and ONLINE COMMUNICATION

See https://kb.wisc.edu/50548 for a general netiquette. Specifically:

- Any comment or answers must be on topic, concise, polite, and respectful of others.
- Assume the best intentions of others in the class and be forgiving when you think that the tone of someone’s post is offensive. It is easy to misread the tone of someone’s written communication. If in doubt, ask an open, honest question about what the person meant so that you can clarify before making assumptions that damage your perception of your colleague.
• Students must not post answers to homework problems.
• Almost all questions should be sent via Piazza. For personal or sensitive issues, use private messages to instructor/TA in Piazza, or email.
• Students should not expect an immediate answer to a question posted late at night before an assignment due date.

**DISPUTE OF GRADE POLICY**
Students have 7 days to dispute a grade on homework, exam grades after the grade is posted on Canvas.

**ADDITIONAL STUDENT RESOURCES**
- University Health Services
- Undergraduate Academic Advising and Career Services
- Office of the Registrar
- Office of Student Financial Aid
- Dean of Students Office

**NOTICE OF COPYRIGHT**
Materials in this course, unless otherwise indicated, are protected by United States copyright law. Materials are presented in this course are for the use of the students enrolled in the course to study and should not be shared, distributed, or sold in print, or digitally, outside the course without permission.

As a student your ability to post or link to copyrighted material is also governed by United States copyright law. The law allows for students to post or link to copyrighted materials within the course environment when the materials are pertinent to course work. Instructors or other staff of the institution reserve the right to delete or disable your post or link if in their judgment it would involve violation of copyright law.

**STUDENTS’ RULES, RIGHTS & RESPONSIBILITIES**
During the global COVID-19 pandemic, we must prioritize our collective health and safety to keep ourselves, our campus, and our community safe. As a university community, we must work together to prevent the spread of the virus and to promote the collective health and welfare of our campus and surrounding community.

**UW-MADISON BADGER PLEDGE**

**COURSE EVALUATIONS**
Students will be provided with an opportunity to evaluate this course and your learning experience. UW-Madison now uses an online course evaluation survey tool, AEFIS. In most instances, you will receive an official email two weeks prior to the end of the semester when your course evaluation is available. You will receive a link to log into the course evaluation with your NetID where you can complete the evaluation and submit it, anonymously. Your participation is an integral component of this course, and your feedback is important to me. I strongly encourage you to participate in the course evaluation.
ACADEMIC CALENDAR & RELIGIOUS OBSERVANCES

- See: https://secfac.wisc.edu/academic-calendar/#religious-observances

ACADEMIC INTEGRITY & DATA ETHICS

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison; academic misconduct is behavior that negatively impacts the integrity of the institution. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these previously listed acts are examples of misconduct which may result in disciplinary action. Examples of disciplinary action include, but is not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion.

The members of the faculty of the Department of Statistics at UW-Madison uphold the highest ethical standards of teaching, data, and research. They expect their students to uphold the same standards of ethical conduct. Standards of ethical conduct in data analysis and data privacy are detailed on the ASA website, and include:

- Use methodology and data that are relevant and appropriate; without favoritism or prejudice; and in a manner intended to produce valid, interpretable, and reproducible results.
- Be candid about any known or suspected limitations, defects, or biases in the data that may affect the integrity or reliability of the analysis. Obviously, never modify or falsify data.
- Protect the privacy and confidentiality of research subjects and data concerning them, whether obtained from the subjects directly, other persons, or existing records.

By registering for this course, you are implicitly agreeing to conduct yourself with the utmost integrity throughout the semester.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES STATEMENT

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA. (See: McBurney Disability Resource Center)

DIVERSITY & INCLUSION STATEMENT

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.
COMPLAINTS

If you have a complaint about a TA or course instructor, you should feel free to discuss the matter directly with the TA or instructor. If the complaint is about the TA and you do not feel comfortable discussing it with him or her, you should discuss it with the course instructor. Complaints about mistakes in grading should be resolved with the instructor in the great majority of cases. If the complaint is about the instructor (other than ordinary grading questions) and you do not feel comfortable discussing it with him or her, contact the Director for Undergraduate Studies, Professor Wei-Yin Loh (loh@stat.wisc.edu) / Director of Graduate Studies, Professor Bret Larget (bret.larget@wisc.edu).

If your complaint concerns sexual harassment, please see campus resources listed at https://compliance.wisc.edu/titleix/resources/. In particular, there are a number of options to speak to someone confidentially.

If you have concerns about climate or bias in this class, or if you wish to report an incident of bias or hate that has occurred in class, you may contact the Chair of the Statistics Department Climate & Diversity Committee, Professor Karl Rohe (karl.rohe@wisc.edu). You may also use the University’s bias incident reporting system, which you can reach at https://doso.students.wisc.edu/services/bias-reporting-process/.