

COURSE AND CONTACT INFORMATION

Course: Economics 6376 Time Series Analysis
Semester: F26
Time: TH 6:10 - 8:40PM
Location: BELL 309

INSTRUCTOR

Name: Gary Cornwall
Campus Address: Monroe 340, Department of Economics
2115 G St., NW, Washington, DC 20052
Phone: 513-384-3855 (**Best way to contact me!**)
Email: gary_cornwall@email.gwu.edu
Office Hours: By Appointment

GRADUATE ASSISTANTS

Name: TBD
Email: TBD
WebEx: TBD
Office Hours: TBD

COURSE DESCRIPTION:

The objective of this course is to give students the tools required to understand, implement, and interpret common models used in time series econometrics. Emphasis is placed on intuition and application. The course will both help students understand how to use time series data to test hypotheses and serve as an introduction to the ideas and techniques of forecasting. Topics covered are: time series properties of data (unit roots, near unit roots, stationarity), difference equations, stationary models (autoregressive and moving-average models), models with trends (deterministic and stochastic), multi-equation models (reduced-form and structural VARs), cointegration and error-correction models, models with time-varying coefficients, forecasting models, and basic forecast evaluation. Students will become proficient with performing basic time series analysis and forecasting using time series statistical software. Restricted to students in the applied economics MA program.

COURSE PREREQUISITES

Applied Macroeconomic Theory, ECON 6305.

Probability and Statistics for Economics, ECON 6374.

Students are expected to be familiar with basic statistical and econometric concepts.

INSTRUCTOR BIOGRAPHY

Gary Cornwall earned his Ph.D. in Economics from the University of Cincinnati in 2017. His research interests are focused on Bayesian modeling methods, real estate, urban/regional, time series/spatial econometrics, and hypothesis testing. His current projects include papers on predicting the land value underlying private structures in the United States, evaluating the impact of closing the world's largest landfill on nearby real estate markets, identifying seasonal time series and unit roots using machine learning methods, and evaluating

the impact of property tax changes for school funding on housing prices in Ohio. Gary is currently a Research Economist at the Bureau of Economic Analysis.

TEXTBOOKS AND READINGS

Applied Econometrics Time Series by Enders, W. (2014), 4th Ed., John Wiley. You may use any of the prior editions as they are substantially the same. Page references to Enders correspond the 4th edition of the text.

Introductory Time Series with R by Andrew V. Metcalfe and Paul S.P. Cowpertwait (2009), Springer. We will use this text as supplemental and practical text. This text presents R programming for time series analysis. Some of the applications we will study come from this text. This text is available electronically through the GW Library at no additional fee.

For additional reference texts, please consult:

Time Series Analysis, James Hamilton, Cambridge, MA: The MIT Press.

Introductory Econometrics: A Modern Approach, 6th ed., Jeffery Wooldridge.

A Guide to Econometrics: 6th Edition, Peter Kennedy

LEARNING OUTCOMES

As a result of completing this course, students will be able to:

1. Understand time series data, test for stationarity or trends.
2. Perform and evaluate hypothesis tests and other statistical methods for time series analysis including VARs, and regression analysis of time series data.
3. Utilize econometric software for time series analysis and economic forecasting.
4. Evaluate forecasts and test different forecast models.

AVERAGE MINIMUM AMOUNT OF INDEPENDENT, OUT-OF-CLASS, LEARNING EXPECTED PER WEEK

In a 15-week semester, including exam week, you should expect to spend a minimum of 4 hours a week for each hour of instruction. For a $2\frac{1}{2}$ hour course worth three credits this means that you should expect to study a minimum of 10 hours outside of class each week.

GRADING POLICY AND METHODS OF ASSESSMENT

Assignment	Grading Points
Problem Sets	40%
Midterm	30%
Final	30%
TOTAL	100%

CLASS PARTICIPATION

Class participation is essential for success in this course. There is no such thing as a stupid question. Dialogue is not only strongly encouraged, it is critical to your understanding of the material. Vocalizing your questions often helps you solidify what you do and do not understand. It also provides your instructor important feedback on the areas in which we need to spend more time. During lecture, I will encourage questions and I will solicit input. If I call on you, please relax, I am NOT trying to intimidate you or embarrass you in any way—far from it. I am trying to encourage active listening, and to keep you engaged in the course. This will greatly assist you in learning the material. If you do not know the answer, I will move on to another student.

PROBLEM SETS

The problem sets are designed to give you the opportunity to review and enhance the material learned in class. *See the schedule for problem set due dates.* **Please type all solutions to the problem sets and submit as a PDF file to Blackboard.** All solutions should have page numbers, your student ID and your complete name. For problems that require computation, please provide annotated code as an appendix as well as the results. Please structure your responses (text, code, and graphics, as applicable) so that it is easy to interpret. I encourage you to work in groups on the problem sets, but your answers must be your own and individual submission. In your own interest you should attempt to solve the homework on your own before your study group meets. Identical or substantially similar answers may be considered to be a violation of the GW Code of Academic Integrity. *Late submissions will not be accepted unless we have previously agreed; if you have an extraordinary circumstance please contact me well in advance for my consideration. If you have not heard from me, assume that I have not granted you request for late submission.*

BEFORE THE FIRST CLASS

You will often be asked to perform computations as part of the problem sets. Please [install R](#) on your personal computer prior to the first class. You may also want to [install RStudio](#). R and RStudio are free and open-source software for computation, statistics, data manipulation, and graphing. R (along with Python) is quickly becoming one of the most desired programming languages in finance, data analysis, and academia. You are free to use any other computational software you are familiar with but I will not provide support for any language other than R.

ATTENDANCE POLICY

Attendance is not required or graded but is strongly recommended; there is a strong applied component to this course and students are therefore encouraged to engage closely with the material. **There is a high correlation between those that attend class regularly and those that end up with a high grade.** Late work is not accepted under normal circumstances; if you have an extraordinary circumstance please contact me in advance for consideration. Answers to problem sets must be submitted through Blackboard.

UNIVERSITY POLICY ON RELIGIOUS HOLIDAYS

Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must inform faculty in the first week of the semester. For details and policy, [click here](#).

ACADEMIC INTEGRITY

Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructor of record for this course, my role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the Code of Academic Integrity. If you have any questions about whether particular academic practices or resources are permitted, you should ask me for clarification. If you are reported or an academic integrity violation, you should contact Conflict Education and Student Accountability (CESA), formerly known as Student Rights and Responsibilities (SRR), to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the University and may include a transcript notation. For more information, refer to [CESA](#) website at or contact [CESA](#).

USE OF ELECTRONIC COURSE MATERIALS AND CLASS RECORDINGS

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to

discipline under the Student Code of Conduct. Contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Contact [Disability Support Services](#) if you have questions or need assistance in accessing electronic course materials.

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office in Rome Hall, 801 22 nd St., NW, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information, see <https://disabilitysupport.gwu.edu/>. Students must arrange with the DSS office well in advance of needing the service.

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success.

GW CAMPUS EMERGENCY INFORMATION

- GW Emergency Services: 202-994-6111
- For situation-specific instructions, refer to [Emergency Procedures Guide](#).

GW ALERT

GW Alert is an emergency notification system that sends alerts to the GW community. GW requests students, faculty, and staff maintain current contact information by logging on to safety.gwu.edu. Alerts are sent via email, text, social media, and other means, including the Guardian app. The Guardian app is a safety app that allows you to communicate quickly with GW Emergency Services, 911, and other resources. Learn more at safety.gwu.edu.

PROTECTIVE ACTIONS

GW prescribes four protective actions that can be issued by university officials depending on the type of emergency. All GW community members are expected to follow directions according to the specified protective action. The protective actions are Shelter, Evacuate, Secure, and Lockdown (details below). Learn more at safety.gwu.edu/gw-standard-emergency-statutes.

- **Shelter**
 - Protection from a specific hazard
 - The hazard could be a tornado, earthquake, hazardous material spill, or other environmental emergency.
 - Specific safety guidance will be shared on a case-by-case basis.
 - **Action**
 - * Follow safety guideline for the hazard
- **Evacuate**
 - Need to move people from one location to another.
 - Students and staff should be prepared to follow specific instructions given by first responders and University officials.
 - **Action**
 - * Evacuate to a designated location.

- * Leave belongings behind.
- * Follow additional instructions from first responders.

- **Secure**

- Threat or hazard outside of buildings or around campus.
- Increased security, secured building perimeter, increased situational awareness, and restricted access to entry doors.
- **Action**
 - * Go inside and stay inside.
 - * Activities inside may continue.

- **Lockdown**

- Threat or hazard with the potential to impact individuals inside buildings.
- Room-based protocol that requires locking interior doors, turning off lights, and staying out of sight of corridor window.
- **Action**
 - * Locks, lights, out of sight
 - * Consider Run, Hide, Fight

CLASSROOM EMERGENCY LOCKDOWN BUTTONS

Some classrooms have been equipped with classroom emergency lockdown buttons. If the button is pushed, GWorld Card access to the room will be disabled, and GW Dispatch will be alerted. The door must be manually closed if it is not closed when the button is pushed. Anyone in the classroom will be able to exit, but no one will be able to get in.

CLASS SCHEDULE

The class schedule is designed to cover the fundamental topics and techniques in time series analysis. The most current course materials can be found on the [course website](#).

Tentative Topic Schedule

Date	Topic	Assignments
2026-08-27	Intro: AR(1), ACF, Random Walk, Spurious Regression	
2026-09-04	Testing for Stationarity	
2026-09-11	AR(p), MA(q) and Their ACF/PACF Fingerprints	Problem Set 1 Due (Sun 11:59)
2026-09-18	ARMA Modeling, Estimation, and Information Criteria	
2026-09-25	Diagnostics, Seasonality, and SARIMA	
2026-10-01	Forecasting Fundamentals	Problem Set 2 Due (Sun 11:59)
2026-10-08	No Class: Professor Travel	
2026-10-15	Forecast Evaluation and Combinations	Midterm Due (Sun 11:59)
2026-10-22	ADL Models and Dynamic Multipliers	Problem Set 3 Due (Sun 11:59)
2026-10-29	Granger Causality	
2026-11-05	Cointegration and Error Correction	
2026-11-12	VAR Models — Mechanical Structure	Problem Set 4 Due (Sun 11:59)
2026-11-19	Impulse Response Functions	
2026-11-26	Thanksgiving Break	
2026-12-03	FEVD and VECMs	Problem Set 5 Due (Sun 11:59)
2026-12-10	Reading Day	
2026-12-17	Finals Week	Final Due 11:59pm

Note: In accordance with university policy, the final exam will be given during the final exam period and not the last week of the semester. For details and complete policy, see: <https://provost.gwu.edu/administration-final-examinations-during-examination-period>

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