



ALBERS

SCHOOL OF BUSINESS  
AND ECONOMICS

Economics and Business Forecasting

ECON 5305 | 3 credit hours | Synchronous

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## COURSE DESCRIPTION

Forecasting is an important activity that firms, consumers, and government organizations engage in to plan for the future. In this course, we study classical time-series models and forecasting techniques to analyze univariate and multivariate time series data. We will focus on the modeling of stationary and linear models for which optimal forecasts will be constructed.

This includes AR, MA, and ARIMA models for dealing with stationary time series and handling trend, seasonality, and unit roots in non-stationary time series. We study Vector Auto Regression (VAR) models, cointegration, and Vector Error Correction (VEC) models for handling multivariate time series data. After successful completion of this course, you should be able to apply these techniques to real-life data using the statistical software R, make quality forecasting using a suitable empirical model based on data, and evaluate the performance of your forecasting using in-sample and out-of-sample data.

## LEARNING OUTCOMES

On successful completion of this course (i.e. by passing this course), you will be able to

1. Understand time-series models and forecasting techniques
2. Make a quality forecasting using a suitable empirical model based on data
3. Evaluate the performance of your forecasting using in-sample and out-of-sample data.
4. Apply these techniques to real-life data using the R packages
5. Present results in an accurate, clear and audience-appropriate manner.

## TEXTS, MATERIALS, and PREREQUISITES

- The text for the course is Forecasting for Economics and Business by Gloria González-Rivera. ISBN-13: 978-0131474932 or ISBN-10: 0131474936.
- Software: R will be used in the lecture and your assignments. R is a popular free software language that statisticians and data analysts use to develop statistical software and conduct data mining. There are many online tutorials, manuals, or guides for using R. I will provide some instructions, sample R codes, and practice problems. You are not required to know R before the class and you are not going to be evaluated on your R coding skills, but it is necessary for you to acquire some R coding skills during the course to complete assignments.

## EVALUATION AND OVERVIEW OF ASSIGNMENTS

Assignment	Points
Problem Sets	70
Research Projects	30
<b>Total Points</b>	<b>100</b>

Point scale	Letter grade	Point scale	Letter grade
94 – 100	A	73 – 76	C
90 – 93	A-	70 – 72	C-
87 – 89	B+	67 – 69	D+
83– 86	B	63 – 66	D
80 – 82	B-	60 – 62	D-
77 – 79	C+	59 and below	F

1. **Problem sets:** Working regularly with the material is essential to learning. To provide you a regular opportunity to engage with the material, I assign weekly problem sets, posted on the course website. Problem sets provide you opportunities to apply methods and solve data problems by often using statistical software.
2. **Research project:** I believe that we all learn best when we can apply what we are learning to answer important questions, both inside and outside the classroom. You will complete a research project that involves gathering data and applying statistical techniques to address answer a business or economic question. Your grade will be based on the quality of your analysis and the effectiveness of your presentation of the findings.

For the activities above, you have plenty of opportunities to work on your own, with your peers, and within a group. All course material and assignments are communicated on Canvas.

## COURSE OUTLINE

### Tentative Course Schedule\*

Date	Readings	Topics
Week1	Chapter 1,2	Introduction and Statistic Review
Week2	Chapter 3	Statistics and Time Series
Week3	Chapter 4	Tools of the Forecaster (a priori for the forecaster)
Week4	Chapter 6	Forecasting with Moving Average(MA)Processes
Week5	Chapter 7	Forecasting with Moving Average(AR)Processes
Week6	Chapter 10	Forecasting the long term: Deterministic and Stochastic Trends
Week7	Chapter 8	Forecasting Practice I (a posteriori using in-sample data)
Week8	Chapter 9	Forecasting Practice II (a posteriori using out-sample data)
Week9	Chapter 11	Vector Auto Regression
Week10	Chapter 12	Cointegration and VEC Model

\*Your learning is my primary concern in this course, so I may modify the schedule if, for instance, we discover we need to spend time on a certain topic and less on another.

## COURSE POLICIES

Instructional methods this quarter will be experimental! It will be conducted as a “asynchronous” learning. A word of caution, although asynchronous learning happens at a time to suit your schedule, this is not self-paced study. All course assignments have specific deadlines.

In our zoom meetings, please keep your video and audio on during the entire meeting time, which makes it easier for us to connect and communicate. If you need to temporarily turn off the video or audio, please feel free to do so.

Remember, too, that if you are having technical problems, you may be able to borrow a Chromebook or internet hotspot from the Library. (See “Academic resources” below or go straight to <https://seattleu.instructure.com/courses/1563070>)

I will regularly ask for your feedback on how the class format is working for you. Expect there to be a few changes as the quarter progresses; in any changes, I will be putting your learning first.

## **OFFICE (STUDENT) HOURS**

The time I have listed as “Office hours” is time for you. Office hours are a chance for you to meet with me individually or in small groups to discuss the course, your learning, your plans for the future, or just to check-in. I have set up one-on-one consultation times. Each appointment lasts for 15 minutes. You are also welcome to sign up for one or multiple meeting time slots with me as you need. I’ve set up a waiting room to ensure you receive my full attention during your time slot – and to maintain your privacy. If these times do not work for you, send me an email with the suggested times.

## **COMMUNICATIONS**

Most of our communication will be conducted on Canvas. I will make an announcement on Canvas whenever I have information to share with the class. Please check announcements regularly.

I encourage you to send me an email with any questions and concerns. I prefer canvas email to SU email because during the school year I check canvas email more frequently than my regular SU email. Also, the canvas email identifies which class the email comes from and I can not discuss grades over the regular SU email because of FERPA. If you send an email to my regular SU email, [sxie@seattleu.edu](mailto:sxie@seattleu.edu), please use Course Code: <your email subject> as the subject.

Please be polite and considerate in all email communications. I prefer to be addressed by my last name. I will do my best to respond to you within 24 hours. This response may come in the form of an email directly back to you or, if the answer would be beneficial to the entire class, I will make an announcement on Canvas.

## **INTERNET ACCESS**

We will use a variety of online applications to communicate and collaborate. As such, you will need a reliable, high-speed Internet connection for the duration of this course. If you are traveling to countries such as China, Vietnam, Saudi Arabia, Iran, Burma, and others, some content in this course may be blocked. Please contact me immediately if you will be traveling to a country that may block Internet access during any portion of this class.

## **ASSINGMENT DEADLINES AND EXTENSIONS**

The assignments in this course build on one another, so the feedback process is an important part of your learning. My plan is therefore to return your assignments as soon as possible after you have submitted them. (My normal policy is to return papers within five working days; I hope to be able to keep to that this quarter.) Faster feedback means you’re more likely to

remember what you wrote and can more easily take the feedback on board for the next assignment.

It would greatly help the learning process if you are able to submit your assignment by the stated deadlines. If you find that you are unable to complete an assignment on time, *please communicate with me in advance*. I do understand that life happens and can sometimes get in the way. I'll do my best to be flexible; for that to happen, we need to keep in dialogue so that I know where you are in your learning and how I can best support you.

To help keep yourself on track, I strongly encourage you to plan ahead: Check the tentative course schedule in this syllabus to see when assignment briefings will be given and when assignments are due. This enables you to block out time in your calendar now so that you know when you will be working on assignments for this course. If you're wondering how much time you need to allow for completing assignments well, then I suggest you use the approach I take for my own writing: make a rough estimate of time and then multiply it by 2.5. This sounds like a lot, but I think you'll find it more realistic for managing your expectations and planning.

An agreement to receive an Incomplete (I) grade may be negotiated if your circumstances do not allow you to finish the course on time. The Incomplete Grades Policy of the university is available on the Office of the Registrar web site: <https://www.seattleu.edu/redhawk-axis/academic-policies/>

### **A note about grades**

Sometimes I receive questions and complaints when students don't get perfect scores on their work. As you think about your grade, please keep in mind:

- Through our schooling, we have been socialized to focus on grades, oftentimes overlooking what we are learning or trying to learn.
- Practice interrupting your socialization about grades and focus on the goal of learning how to receive feedback and how to use it to improve your work in your next assignment.
- Ask yourself why you expect to receive a perfect score every time (and how your social identities may inform that expectation).

### **\*Your workload in this course**

For every hour in class, you can expect to devote an average of two hours outside of class for readings and preparation, as well as substantive assignments and participation exercises. As this is a three-credit class, you can reasonably expect an average of 6 hours of homework each week. I have tried to ensure that the workload is evenly distributed throughout the course, but if you find you have less than the normal amount of work one week, I suggest you read ahead for future classes.

## **ACADEMIC RESOURCES**

My goal is to create a learning environment in which you can be successful and feel supported. I will work hard to create and improve the learning environment throughout the quarter based on my observations of the course and your feedback on what would help you learn more. In return, I ask and encourage you to make the most of this learning opportunity. As we are using a remote learning format, you may find that some of your previously successful strategies in face-to-face and on-campus settings are less suited to this environment. I encourage you to explore the services below and to work on the assumption that in this quarter, you'll be developing some new strategies that will help you become a more flexible learner. I am keen to support you in that growth and plan to build in opportunities for us all to share new strategies either in scheduled class time or via a Canvas chat.

### **Support for remote learning**

Remember to review the online tutorial that our Center for Digital Learning and Innovation has created to support your remote learning experience:

<https://seattleu.instructure.com/courses/1563070>

Students and faculty have reported a more engaging class experience when using video on Zoom. We know not everyone has the ability to have their camera on all the time, for a variety of reasons. If you aren't able to do so, be sure to stay connected in other ways (in chat or vocally).

### **Borrow a Chromebook or an internet hotspot from the Library**

If you are having difficulty with remote learning because your laptop is older or your internet access is patchy, the Library is currently loaning out Chromebooks and internet hotspots. You can submit a request at the following link:

[https://seattleu.qualtrics.com/jfe/form/SV\\_9Bjo8RxYefZVeJv](https://seattleu.qualtrics.com/jfe/form/SV_9Bjo8RxYefZVeJv)

## **Library and Learning Commons**

<http://www.seattleu.edu/learningcommons/>

## **Writing Center**

The Seattle University Writing Center supports SU students from all levels of writing expertise, voices, experiences, and writing practices to achieve their writing goals. We seek to provide an accessible, anti-oppressive, and collaborative space for learning and growth through one-on-one peer consultations. The peer consultants are also students who engage in intensive study and hands-on practice to provide thoughtful feedback and to share writing strategies.

Consultations are available at any stage of the writing process, from brainstorming, organizing, and developing rough draft to revising and editing in later drafts. The Writing Center offers appointments in various modalities: in-person and online, synchronous, and asynchronous.

Please visit <https://www.seattleu.edu/writingcenter/> to learn more about the Writing Center.

You can schedule an appointment and select an available modality through

<https://seattleu.mywconline.com/>

## **Learning Assistance Programs**

Learning Assistance Programs (LAP) provides peer tutoring, facilitated study groups, and learning strategy development through scheduled workshops and individual consultation sessions with a learning specialist. We offer these in various modalities (in-person, synchronous, and asynchronous), depending on university policy and LAP staff availability.

Please visit our website <https://www.seattleu.edu/learning-assistance/> or e-mail us at [learningassistance@seattleu.edu](mailto:learningassistance@seattleu.edu) for the most updated information about accessing services.

## **Research Services**

Research help is available to students at any stage in the research process. Students can schedule a virtual consultation with our team of Research Services Librarians and Student Peer Research Consultants (SPRCs) to get help finding and assessing sources, learn database search skills, and develop research topics.

To learn more, or for assistance via chat/phone/email, check out our Get Research Help page (<https://www.seattleu.edu/library/get-research-help/>) or book a Virtual Consultation online (<https://www.seattleu.edu/library/consultation/>).

## **Math Lab**

The Math Lab offers one-on-one tutoring to students enrolled in lower division mathematics courses. Please visit our website at <https://www.seattleu.edu/scieng/math/student-resources/math-lab/> for more information.

## **English-language learning center (ELLC)**

The English Language Learning Center (ELLC) offers free tutoring for all SU students who are non-native speakers of English. Experienced ELLC tutors can help you improve your English language skills and better understand American culture. We can help with any type of assignment: written essays, online discussions, oral presentations, interview practice, etc. For the schedule or to book a session please visit <https://www.seattleu.edu/ellc/ellc-tutoring/>

## **Academic integrity tutorial**

<https://www.seattleu.edu/academic-integrity/resources-for-students/>

## **UNIVERSITY POLICIES**

### **Support for students with disabilities**

Seattle University values diverse types of learners and is committed to ensuring that each student is afforded an equal opportunity to participate in learning experiences. Disability Services (DS) works with students with disabilities to provide reasonable accommodations to support their learning experiences. Disabilities include “invisible disabilities,” such as a learning disability, a chronic health problem, or a mental health condition. This could include any long-term effects of COVID, even after recovery (“long-COVID”), if a health care provider determines it is a chronic health problem.

If you have, or suspect you may have, a disability that may interfere with your performance as a student in this course and have not yet been assessed by DS, please contact DS staff at [DS@seattleu.edu](mailto:DS@seattleu.edu) or (206) 296-5740. Disability-based accommodations to course expectations can be made only through this process and must be approved by DS before implemented in a course. I am committed to working with you, so please consider meeting with me to discuss the logistics of implementing any accommodations approved by DS.

## **Notice on Religious Accommodations**

It is the policy of Seattle University to reasonably accommodate students who, due to the observance of religious holidays, expect to be absent or endure a significant hardship during certain days of their academic course or program. Please see, Policy on Religious Accommodations for Students (<https://www.seattleu.edu/media/policies/Policy-on-Religious-Accommodations-for-Students---FINAL.PDF>).

## **Zoom meeting norms**

During our Zoom meetings, we will jointly create course norms (or “agreements”) to which we will all abide so that we have the most productive and positive remote learning environment. In face-to-face classes, regular examples have included that we agree to:

- Start and end on time
- Come to meeting prepared
- Participate actively in discussion
- Show one another courtesy, including when we disagree.

Given our circumstances this quarter, we will revisit these norms regularly to focus on what works for our learning together, including norms for sessions via Zoom and norms for online discussions.

## **Meeting recording**

Zoom meetings of this course may be recorded. Any recordings will only be available to students registered for this class. Recordings may not be reproduced, shared with those not in the class, or uploaded to other online environments.

## **Academic policies on the Registrar website**

<https://www.seattleu.edu/redhawk-axis/academic-policies/>

Be sure that you understand the following university academic policies, posted on the Registrar’s website:

- [Academic Integrity](#)
- [Academic Grading Grievance Policy](#)

- **Support for Students with Disabilities**

If you have, or think you may have, a disability (including an “invisible disability” such as a learning disability, a chronic health problem, or a mental health condition) that interferes with your performance as a student in this class, you are encouraged to arrange support services and/or accommodations through Disabilities Services staff located in Loyola 100, (206) 296-5740. Disability-based adjustments to course expectations can be arranged only through this process.

- **Office of Institutional Equity**

Title IX of the Education Amendments of 1972 (Title IX) prohibits discrimination based on sex in educational programs or activities that receive Federal financial assistance. This prohibition includes sexual misconduct, which encompasses sexual harassment and sexual violence. Seattle U remains committed to providing a safe and equitable learning, living, and working environment. Seattle U offers emergency, medical, and other support resources, as well as assistance with safety and support measures, to community members who have experienced or been impacted by sexual misconduct.

Seattle U requires all faculty and staff to notify the University’s Title IX Coordinator if they become aware of any incident of sexual misconduct experienced by a student.

For more information, please visit <https://www.seattleu.edu/equity/>. If you have any questions or concerns, you may also directly contact the Title IX Coordinator in the Office of Institutional Equity by email: [oiie@seattleu.edu](mailto:oiie@seattleu.edu) or phone: (206) 296-2824.