

San José State University
Social Sciences/Economics
Econ 138, Business and Economic Forecasting, 01, Spring, 2021

Course and Contact Information

Instructor:	Dr. Sanchita Mukherjee
Office Location:	DMH 214
Telephone:	
Email:	sanchita.mukherjee@sjsu.edu
Office Hours:	Mondays 1:30pm-2:30pm or by appointment
Class Days/Time:	MoWe 12:00PM - 1:15PM
Classroom:	Online (I will hold live lectures on Zoom MoWe 12:00PM - 1:15PM)
Zoom Live Lecture Link:	https://sjsu.zoom.us/j/87329064287
Zoom Live Lecture Meeting ID:	873 2906 4287
Prerequisites:	ECON 1A, ECON 1B and a semester of statistics.

Course Description

People routinely plan around the weather forecast, and are often displeased when it unfolds differently than expected. Similarly, movements in the economy matter to individuals, businesses, and governments, and these economic agents are likewise uncomfortable with unexpected changes in the economy. Thus, reliable ways to forecast economic variables are useful.

The purpose of this course is to introduce an array of methods and practices for analyzing time-series data and generating statistical forecasts. This will be accomplished through a mix of theoretical discussions and software-based applications to real-world problems. As will become clear, many familiar methods of inference are not well adapted to analyzing data with a time component, although some time-series methods do have close cross-sectional analogues.

Who should take this course? Economics 103A and 103B (Introduction to Econometrics) has long been the flagship statistical courses for the economics major; this course is intended as its companion. Any student with graduate school aspirations should take this course (as well as ECON 103). Students interested in the quantitative aspects of business decisions will benefit greatly from this material as well. Practicing business professionals and consultants value these skills.

You are encouraged to use R. R is free, available on almost every operating system, and there are thousands of add-on packages to do almost anything you could ever want to do. I recommend you use R with RStudio.

Course Format

Technology Intensive, Hybrid, and Online Courses

This synchronous web-based course is supported on Canvas at: <https://sjsu.instructure.com>
Official announcements, lecture slides, lecture videos, quizzes, exams and other class materials will be posted in Canvas, so please check regularly for messages pertaining to the course.

You would need a computer (laptop/desktop) and access to internet. The exams will require [Lockdown Browser](#). Lockdown browser does not work on tablets. So, you would need a laptop or a desktop computer. All of our assignments and exams would have to be submitted online via Canvas.

Course Goals and Learning Objectives

CLOs	PLOs	Problem Sets
1. Explain a variety of statistical model and filtering tools for time series and identify correct methods to analyze these models.	PLO 3 research methods	Learning outcomes are satisfied by problems sets that contain two parts. The theory part helps students to gain basic understanding of the time series analysis. The application part asks students to do practical time series analysis using R.
2. Choose an appropriate ARIMA model for a given set of data and fit the model using an appropriate package.	PLO 4 Specialist Area-Quantitative Methods PLO 5 Communication	The problem sets and group discussions help students form an interesting forecasting question, gather relevant data, apply appropriate methods, and write up their results in the form of a well-written report.
3. Be able to apply R in time series/forecasting situations		
4. Compute forecasts for a variety of linear methods and models.		

Required Texts/Readings

Textbook

1) [Real Econometrics: The Right Tools to Answer Important Questions by Michael Bailey](#) (2nd Edition)

ISBN-13: 978-0190857462

ISBN-10: 0190857463

It is available at any of the online outlets (Amazon, for example). Used copies are fine. Older editions are fine.

2) [Forecasting: Principles and Practice, Hyndman & Athanasopoulos](#) (3rd ed., 2020)

The textbook is highly recommended and it is FREE

The course material will be based on a set of slides being prepared by the instructor.

Other Readings

Articles available online and/or Canvas.

Other technology requirements / equipment / material

The class will use a computer program called R to gain practical experience in econometrics. All students must have installed on their home machines free R and R Studio software.

Course Requirements and Assignments

1) Five Problem Sets (40% of your grade, 8% each):

Six problem Sets, lowest grade dropped. Each of these problem sets involves empirical analysis on R. They will be announced and posted on Canvas. The data for the problem sets will be posted on Canvas as well. Please submit assignments on Canvas on the day they are due. Assignments submitted after answers are distributed will receive no credit.

2) Four Quizzes (20% of your grade, 5% each)

Quizzes will be multiple choice and they will be announced and posted on Canvas. The quiz is meant to assess your understanding of the lecture material. Quizzes are not timed, and you have 2 attempts on each quiz. The higher score will count towards your grade. Late quizzes will receive no credit.

3) Group Term Paper Presentations (20% of your grade)

Why group term paper presentations? This is to help you brainstorm ideas with your group members and discuss about the topics you want to research and may find interesting. You can divide the work among the group members, get a good head start and learn to work as part of the team. This does require every group member to be engaged and in touch with their group members. So please make sure you are doing your part and making a significant contribution. One group, one presentation. You can either use PowerPoint or Google Slides.

- Each group will make a 12-minute presentation via zoom (each speaker will get 4 minutes). Then they will get 3 minutes to answer any questions the rest of the class may have on the presentation. Max. 10 slides per presentation.
- The presentation would have to be submitted on Canvas the day before your presentation. **One group, one submission.**

4) Individual Final Term Paper (20%):

Once you make the group-presentation in-front of your class via zoom, you will get feedback from your classmates and your instructor. Next, you would have to incorporate the comments and suggestions (that you think are reasonable) to your work. Make changes as you may see fit and **submit your individual final term paper on May 20 on Canvas.** Every student will have to submit his/her own term paper. **I am expecting you to have the same topic for group presentation and the final term paper.** Here's the structure of your final term paper:

Paper Structure:

I. Title page.

II. Abstract. This should be less than 50 words and summarize the topic, methodology, and main findings. It should appear on your title page.

III. Introduction. This section should state the nature and objectives of the project. Make sure to provide some background or motivation for why your project is interesting.

IV. Literature Review.

IV. Description of the model. The model should be clearly stated and any equations carefully explained. You should write out the econometric model you plan to estimate, and discuss the expected impact of the exogenous variables in your model.

V. Data description and model estimation. You should use the techniques developed in class to analyze your data and estimate your model. Make sure to describe the dataset you are using by providing summary statistics of important variables. Your results should be reported and discussed in this section and could include: parameter estimates, standard errors, t-statistics, F-statistics, R-squared, tests for autocorrelation, heteroskedasticity, and possible multicollinearity, as appropriate.

VI. Conclusion. Review the major findings as well as possible extensions for future work. Make sure to mention any limitations of your approach as well as alternative explanations of your results. Policy implications, if any, could also be included in this section.

VII. Tables and graphs. Your paper must include at least one table and one graph. The tables and graphs should be well-labeled and accessible to the reader—do not merely print out your regression output with cryptic variable names.

Appendix If you have a lot of regression results or other details in your theoretical/statistical model that merit to be included yet, they may distract the reader, you may include them in an appendix.

Grading Information

Assignments	% of your grade	Due Dates
5 Problem Sets (total 6, lowest grade dropped)	40% total (8% each)	See Course Schedule below, will be announced on Canvas
4 Quizzes	20% (5% each)	See Course Schedule below, will be announced on Canvas
Group Term paper Presentations	20%	See course schedule below
Individual Final Term Paper (Topic can be the same as the group project presentation)	20%	Thursday, 5/20 by 11:59pm (online on Canvas)

97-100 A+	93.0-96.9 A	90.0-92.9 A-
87.0-89.9 B+	83.0-86.9 B	80.0-82.9 B-
77.0-79.9 C+	73.0-76.9 C	70.0-72.9 C-
67.0-69.9 D+	63.0-66.9 D	60.0-62.9 D
Below 60 F		

Final grades will be curved. However, the curve will never hurt your grade. I do not round up grades, e.g., an 86.9 is a B, not a B+.

I do not offer extra credit work to an individual student.

Classroom Protocol

While this is an online class, students are encouraged to interrupt and ask questions.

If you experience any difficulty in this course, please do not hesitate to come to me for help. I am available during office hours and by appointment. However, I greatly appreciate questions asked during class – I

guarantee that if you have a question, many of your classmates have the same question in mind as well.

University Policies

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's Catalog Policies section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at <http://www.sjsu.edu/advising/>.

Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course.

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
 - It is suggested that the green sheet include the instructor's process for granting permission, whether in writing or orally and whether for the whole semester or on a class-by-class basis.
 - In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. [The Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center \(AEC\)](http://www.sjsu.edu/aec) at <http://www.sjsu.edu/aec> to establish a record of their disability.

In 2013, the Disability Resource Center changed its name to be known as the Accessible Education Center, to incorporate a philosophy of accessible education for students with disabilities. The new name change reflects the broad scope of attention and support to SJSU students with disabilities and the University's continued advocacy and commitment to increasing accessibility and inclusivity on campus.

Econ 138-01/ Business and Economic Forecasting, Spring 2021, Course Schedule

Tentative Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/27	Introduction, Syllabus, Basics
2	2/1	Bailey Chapter 1: The Quest for Causality
2	2/3	Bailey Chapter 1: The Quest for Causality Quiz 1 due (2/5)
3	2/8	Bailey Chapter 2: Good Data Practices
3	2/10	Bailey Chapter 3: Bivariate OLS: The Foundation of Econometric Analysis Quiz 2 due (2/12)
4	2/15	Bailey Chapter 3: Bivariate OLS: The Foundation of Econometric Analysis
4	2/17	Bailey Chapter 3: Bivariate OLS: The Foundation of Econometric Analysis Problem Set 1 due (2/19)
5	2/22	Bailey Chapter 13: Time Series: Dealing with Stickiness over Time
5	2/24	Bailey Chapter 13: Time Series: Dealing with Stickiness over Time Quiz 3 due (2/26)
6	3/1	Bailey Chapter 13: Time Series: Dealing with Stickiness over Time
6	3/3	Hyndman and Athanasopoulos (H&A) Chapter 1: What can be forecast? Problem Set 2 due (3/5)
7	3/8	H&A Chapter 2: Time Series Graphics
7	3/10	H&A Chapter 2: Time Series Decomposition Problem Set 3 due (3/12)
8	3/15	H&A Chapter 5 The forecaster's toolbox
8	3/17	H&A Chapter 5 The forecaster's toolbox

Week	Date	Topics, Readings, Assignments, Deadlines
9	3/22	H&A Chapter 6 Judgmental forecasts
9	3/24	Discuss with each group separately about the status of their term paper presentations (10 min per group) Problem Set 4 due (3/26)
10	3/29	Campus Closed: Spring Recess – No Classes
10	3/31	Campus Closed: Spring Recess – No Classes
11	4/5	H&A Chapter 7 Time series regression models
11	4/7	H&A Chapter 7 Time series regression models Quiz 4 due (4/16)
12	4/12	H&A Chapter 8 Exponential smoothing
12	4/14	H&A Chapter 8 Exponential smoothing Problem Set 5 due (4/9)
13	4/19	H&A Chapter 9 Forecasting with ARIMA models
13	4/21	H&A Chapter 9 Forecasting with ARIMA models
14	4/26	H&A Chapter 9 Forecasting with ARIMA models
14	4/28	H&A Chapter 9 Forecasting with ARIMA models Problem Set 6 due (4/30)
15	5/3	Chapter 10: Dynamic regression models
15	5/5	Chapter 10: Dynamic regression models Chapter 13 Some practical forecasting issues
16	5/10	Group Presentations – Group 1, Group 2, Group 3, Group 4
16	5/12	Group Presentations – Group 5, Group 6, Group 7, Group 8
17	5/17	Group Presentations – Group 9, Group 10 and Group 11 Use the rest of the class to answer questions that you might have on your term paper
Final Paper Due	Thu, 5/20	Online on Canvas