

Course Policies and Syllabus

- **Instructor** Professor Valerie Poynor, McCarthy Hall 104E, Ext. 7635, vpoynor@fullerton.edu
- **Lecture** Tu/W/Th 5:30 - 8:15pm (zoom or in-person MH 476)
Zoom Lecture Link: <https://fullerton.zoom.us/j/89185620023?pwd=bGVoT0EyRGROTUIEeGxuOWdTcEVldz09>
Meeting ID: 891 8562 0023
Passcode: 4Cast24
- **Office Hours** M 5:30pm-7:00pm; W noon-1:30pm; or by appointment; zoom unless otherwise requested
Zoom Office Hours: <https://fullerton.zoom.us/j/552790248?pwd=VE14cmNTY2E0YjldVpQcjhtclRtQT09>
Meeting ID: 552 790 248
Passcode: PonyorOH

Course Description: In this course, we will cover modeling methods and applications in analyzing time series. We will discuss a variety of statistical forecasting methods and models for data collected over time, and show how to use these to solve forecasting problems. The objective of the course will be to provide students with an introductory level theoretical foundations in time series analysis and a more advance level in application using the software language R. This course introduces new models building on your prior knowledge of linear models and regression analysis. Please refresh your prior knowledge on these topics from any courses in regression analysis you have taken before, as it is absolutely necessary for this course. Some of the topics that will be covered are: time series regression; EDA; fitting and forecasting AR, ARMA, ARIMA models; filtering, smoothing, and forecasting DLMS.

Web Page (using Canvas): You can login to Canvas using your campus user ID and password. Course topics, announcements, updates, solutions, extra materials, handouts, data-sets, grades, etc. will be posted here. There are also discussion boards on Canvas for your questions, and you are encouraged to answer each other's questions. Material posted here may appear in your exams.

Course Materials: Time Series Analysis and Its Applications in R with R Examples by Shumway and Stoffer; Fourth Edition; Springer; ISBN 978-3-319-52452-8
Additional material will be in the lecture-notes delivered in class.

Statistical Software: The **free statistical software R** will be used for data analysis. R is available on the machines in the computer labs to which you have access. For those of you who would like to download R on your PC/laptop please visit <http://www.r-project.org/>. We will use the editor RStudio. After installing R, visit <http://www.rstudio.com/products/rstudio/download/> to download and install RStudio. You are strongly encouraged to type all your homework assignments and required to type all your take-home exams using \LaTeX or Rmarkdown.

Optional Textbooks for Further Reading:

- Time Series: Modeling, Computation, and Inference by Prado and West; Chapman and Hall/CRC; ISBN 978-1-420-09336-0
- Introduction to Time Series and Forecasting by Brockwell and Davis; Third Edition; Springer; ISBN: 978-3-319-29854-2

Course Syllabus and Tentative Schedule:

Lecture	Content Discussed	Reading/Comments
Tu 05/28	Course Introduction/Characteristics of Time Series	Sections 1.1 - 1.3
W 05/29	Stationarity/ACF	Sections 1.4, 1.5
Th 05/30	Time Series Regression	Sections 2.1
F 05/31	NA	Last Day to Add/Drop without a "W"
Tu 06/04	Time Series Regression/EDA and Smoothing	Sections 2.2, 2.3
W 06/05	Introduction to AR/ARMA models	Section 3.1
Th 06/06	Differencing Eqns and ACF/PACF	Sections 3.2, 3.3
Tu 06/11	Forecasting AR/ARMA models	Section 3.4
W 06/12	Estimation	Section 3.5
Th 06/13	ARIMA models	Sections 3.6 - 3.8
Tu 06/18	Dynamic Linear Models (DLMs)	Section 6.1
W 06/19	Filtering, Smoothing, Forecasting in DLMs	Section 6.2
Th 06/20	MLE for DLMs/Bayesian Approach for DLM	Section 6.3 ,6.12
Tu 06/25	Presentation Preparation	
W 06/26	Final presentations	
Th 06/27	Final presentations	

Grading: There will be 4 take-home exams (each worth 20% of your course grade) and a final project and presentation (worth 20% of your course grade). Letter grades will be assigned according to the distribution of the overall grades. Plus-minus grading will be used. Late assignments will not be accepted. Make-up exams will be given only in extreme instances and only with advance permission of the instructor. Any student who does not take an exam at the scheduled time without prior consent of the instructor will receive a grade of zero on that exam. If any student feels that a sudden illness is sufficiently extreme to warrant a make-up exam, the instructor must be provided with documentation prepared by an appropriate authority.

Make-Up Policy: Late assignments and projects are not accepted. Make-up exams will be given in extreme instances and only with advance permission of the instructor. Any student who does not take an exam at the scheduled time without prior consent of the instructor will receive a grade of zero on that exam. If any student feels that a sudden illness is sufficiently extreme to warrant a make-up exam, the instructor must be provided with documentation prepared by an appropriate authority.

Required Technology and Materials: Students who join the class remotely or use the virtual office hours must have all of the following:

- A computer equipped with a **webcam**, and a **microphone**.
- Cable or DSL access to the Internet with minimum downloads speed of 3Mb/Sec.
- A scanner or app will be required to scan handwritten material which will be uploaded onto Canvas. All scanned material should be in pdf format. Pictures from a camera are absolutely not acceptable.
- Zoom is the software that we use for our online course delivery. You can download the software from <http://www.fullerton.edu/zoom/>

Online Course Policies and Expectations: Students will be expected to

- Meet California State Fullerton's level of computer competency for entering freshmen (www.fullerton.edu/senate/PDF/300/UPS320-030.pdf/): All entering students are expected to be

knowledgeable in the use of a personal computer (PC or Macintosh) prior to being admitted to the university. Entering students should have 1) the ability to use a personal computer to locate, create, move, copy, delete, name, rename, and save files and folders on hard drives and on secondary storage devices such as floppy disks; 2) the ability to use a word-processing program that runs on a PC or Macintosh computer to create, edit, format, store, retrieve, and print documents; 3) the ability to use an electronic mail system to receive, create, edit, print, save, and send an e-mail message with and without an attached file; and 4) the ability to use an Internet browser to search the World Wide Web;

- Have ongoing reliable access to a computer with Internet connectivity for regular course assignments;
- Utilize MS Office (including Word, PowerPoint, Publisher, and Excel) to learn content and communicate with colleagues and faculty; have the ability to regularly print assignments;
- Use of scanners to scan material;
- Ability to install required software
- Use Internet search and retrieval skills to complete assignments;
- Upgrade his/her skills in educational technology throughout the program;
- Apply his/her educational technology skills to complete expected competencies;
- Utilize other software applications as course requirements dictate; and

Pollak Library policy for Online Instruction Students Please check the Pollak Library resources and services for online courses at <http://www.library.fullerton.edu/about/guidelines/online-instruction-guidelines.php>

Technical Problems: In the event of technical problems, a hard copy of student assignment should be submitted by fax to the instructor at 657-278-3972. As a last resort, you may mail your assignment postmarked on the due date of the assignment/test to the following address: V. Poynor, Mathematics Department, 800 N. State College Blvd., Fullerton, CA 92834. The assignments must have the course number, assignment number, and the instructor's name specified at the top of the first page. Moreover, technical problems should be reported to Mathematics Department IT at 657-278-3448.

Other Information:

1. **Students with Special Needs:** If you have a disability or special need for which you are or may be requesting an accommodation, please inform me and contact Disability Support Services, located in University Hall 101, as early as possible in the term. For more information, Disability Support Services can be reached by calling (657) 278-3117 or visit their website at www.fullerton.edu/DSS. Of course, confidentiality will be protected.
2. **Emergency Procedure Notice to Students:** The safety of all students attending California State University Fullerton is of paramount importance. During an emergency it is necessary for students to have a basic understanding of their personal responsibilities and the University's emergency response procedures. In the event of an emergency please adhere to the following guidelines:

Before an emergency occurs-

- (a) Know the safe evacuation routes for your specific building and floor.
- (b) Know the evacuation assembly areas for your building.

When an emergency occurs-

- (a) Keep calm and do not run or panic. Your best chance of emerging from an emergency is with a clear head.

- (b) Evacuation is not always the safest course of action. If directed to evacuate, take all of your belongings and proceed safely to the nearest evacuation route.
- (c) Do not leave the area; remember that faculty and other staff members need to be able to account for your whereabouts.
- (d) Do not re-enter the building until informed it is safe by a building marshal or other campus authority.
- (e) If directed to evacuate the campus please follow the evacuation routes established by either parking or police officers.

After an emergency occurs-

- (a) If an emergency disrupts normal campus operations or causes the University to close for a prolonged period of time (more than three days), students are expected to complete the course assignments listed on the syllabus as soon as it is reasonably possible to do so.
- (b) Students can determine the University's operational status by checking the University's web site at <http://www.fullerton.edu>, calling the University's hotline number at 657-519-0911, or tuning into area radio and television stations. Students should assume that classes will be held unless they hear or read an official closure announcement.

Emergency Calls: Dial 9-1-1. All campus phones and cell phones on campus reach the University Police Department Non-emergency line: (657) 278-2515.

3. **Academic Integrity:** Students are expected to maintain a high standard of academic integrity. Policies on academic integrity will be strictly enforced. Familiarize yourself with the academic dishonesty policy, which can be found in the current student handbook or on the web at <http://hhd.fullerton.edu/MSW/documents/StudentHandbook.pdf>. According to the Policy on Online Instruction (UPS 411.104), students enrolled in online courses are subject to the same university policies and procedures applicable to students attending courses on campus. Academic standards regarding cheating, plagiarism, and appropriate online behavior ("Netiquette") shall be according to the UPS 300.021 Academic Dishonesty found at <http://www.fullerton.edu/senate/documents/PDF/300/UPS300-021.pdf>.