Statistics 474: Introduction to Time Series and Forecasting

Spring 2021

Prof. Suess, Department of Statistics and Biostatistics, CSU East Bay

Lecture:

- Section 1: MW 6:30 to 7:45, See Blackboard for the Zoom link.
- Intructor: Prof. Eric A. Suess Office: NSc 319 Phone: 510-885-3879 e-mail: eric.suess@csueastbay.edu

Office Hours: MW 2 to 3pm, or by appointment

Class Website: http://cox.csueastbay.edu/~esuess/stat474/

Required Texts:

• Hyndman and Athanasopoulos, Forecasting: Principles and Practice, 2021.

Reference Texts:

- Shumway and Stoffer, Time Series Analysis and Its Applications, Fourth Edition, Springer-Verlag, 2016.
- Box, Jenkins, Reinsel, Ljung, Time Series Analysis, Forecasting and Control, Fifth Edition, Wiley, 2015.
- Brockwell and Davis, Introduction to Time Series and Forecasting, Second Edition, Springer-Verlag, 2002.
- Chatfield, The Analysis of Time Series, An Introduction, Sixth Edition, Chapman-Hall, 2003.
- Diggle, Time Series, A Biostatistical Introduction, Oxford Science Publications, 1990

Material To Be Covered: In this course we will cover the fundamentals of Statistical Time Series analysis, the study of correlated random variables over time. Descriptive methods will be introduced to describe trends, seasonal patterns, and autocorrelation in time series data. Time Domain Methods of analysis such as Autoregression and ARIMA modeling will be presented. Frequency Domain Methods will also be briefly introduced. The class will be roughly split between the discussion of theory and computer applications applied to real data. Examples will come from such fields as Economics, Biology, Medicine, Seismology, and Engineering.

Homework: A list will also be on the website. Homework will be assigned weekly. Homework will be due on Mondays, which means you should complete the homework and come to class prepared to ask questions. Homework will be "collected" though Blackboard and needs to be submitted by Friday of the week the homework is due.

Quizzes and Exams: Two short quiz, one midterm will be given and the final. All take-home.

Grading:

- Homework 15%
- Quizzes 5%
- Midterm 25%
- Project 30%
- Final 25%

Policy on Make-up Exams: You are expected to take the quizzes and exams at the scheduled times. In case of genuine emergency, illness or hardship, for which you can present written documentation I may agree to arrange for a make-up exam. Make-up exams must always be arranged BEFORE the regular exam is given and always take place AFTER the regular exam. Quizzes may not be made up!

Statistics 452 SLOs

Student Learning Outcomes (SLO's):

Students graduating with an B.S. in Statistics from Cal State East Bay will be able to:

- 1. Apply basic computational skill in descriptive statistics and graphical displays; hypothesis testing and confidence intervals; modeling and error analysis.
- 2. Communicate to others results involving descriptive statistics and graphical displays; hypothesis testing and confidence intervals; modeling and error analysis.
- 3. Analyze data using appropriate statistical computer software and to interpret the results covering descriptive statistics and graphical displays; hypothesis testing and confidence intervals; modeling and erroranalysis.