THE UNIVERSITY OF TEXAS AT TYLER
SOULES COLLEGE OF BUSINESS
Fall 2024

COURSE NUMBER: FINA 4357 / FINA 5357

COURSE TITLE: Forecasting

INSTRUCTOR: Dr. Vivek Pandey

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OFFICE HOURS: Tuesday 2:30 - 4 pm & Wednesday 2 – 4 pm. Other times by appointment.

CLASS MEETING & LOCATION: Tuesdays and Thursdays, 12:30 – 1:50 pm, COB 121

TEACHING METHOD: Lectures, class discussions, programming and analytical exercises

NOTE: THIS COURSE ONLY USES OPEN EDUCATIONAL RESOURCES WHICH ARE AVALIABLE TO STUDENTS AT NO COST

REQUIRED TEXT: Forecasting: Principles and Practice, 2nd Edition, By Rob J Hyndman and George Athanasoupoulos, Monash University, Australia. An electronic version of the textbook is available free of charge at https://otexts.com/fpp2/ Additionally, if you would like a printed copy, you can purchase one from Amazon.com. To be clear, a printed copy of the book is not required for this class, you should only buy it if you feel that online access to the free e-book will be insufficient for your needs.

REQUIRED ACCESSORIES: The statistical software we will use in this class is *R,* freely available from https://www.r-project.org/ and *R-Studio*, also available for free at https://www.rstudio.com. We will also use Datacamp to access online courses for learning the essentials of R and forecasting with R. This resource is provided free of charge for students in this course in conjunction with Datacamp for Classroom initiative.

COURSE DESCRIPTION: This course is dedicated to teaching students tools in econometrics that are especially useful in forecasting time series data, such as stock values, future energy prices, unemployment rate, GDP, etc. This course will use a flipped model where pre-recorded class lectures are made available online with very few mandatory in-person meetings. In-person class meetings

will be used for hands-on practical exercises as well as in-class exams only.

LEARNING OBJECTIVES: Upon completion of this course, the student will learn the essentials of and demonstrate proficiency in:
- Graphical examination and visualization of time series data
- Decomposition of Times Series into trend, seasonal, cyclical, and irregular components
- Analyzing and forecasting the dynamics of business and economic data
- Evaluation of the forecasting accuracy for competing forecasting methods
- Using statistical analysis software (*R* and *R-Studio*) for data analysis and forecasts
- Making subjective forecast adjustments based on new information

CONTENT OUTLINE:

Week / Date	Topic / Activity
Aug 27	**Mandatory** in-person introductory meeting
Week 1	Chapter 1: Introduction to Forecasting (lecture and notes posted online)
Aug 29	In-person class – review of data visualization
Sep 1	*Self-introduction due on Discussion Board*
Week 2	Chapter 2: Time Series Graphics (lecture and notes posted online)
Sep 3	**Mandatory** in-person meeting**:** Practical Exercise 1- Running stock filters in EIKON
Weeks 3-4	Chapter 3: The Forecaster's Toolbox (lecture and notes posted online)
Sep 10	*Practical Assignment 1 due*
Sep 10	*Graduate research paper proposals due (FINA 5357 students only)*
Sep 10	In-person class – review of tools for forecasting
Sep 12	In-person class: Review for Exam 1
Sept 12	*Datacamp Assignment 1 due: Intro to R for Finance*
Sep 17	**Exam 1 – Mandatory** in-person exam administration
Week 5	Chapter 4: Judgemental Forecasts (lecture and notes posted online)

Sep 24	In-person meeting: Lab Exercise for importing and merging data in R
Sep 26	*Datacamp Assignment 2 due: Intro to Data Visualization …*
Weeks 6-7	Chapter 5: Time Series Regression Models (lecture and notes posted online)
Oct 1	In-person meeting: Lab Exercise - Obtaining financial markets data and optimizing portfolios
Oct 3	In-person class – review of regression models
Oct 8	**Mandatory** in-person meeting**:** Practical Exercise 2 - Forecasting stock returns using the market model.
Weeks 8-9	Chapter 7: Exponential Smoothing (lecture and notes posted online)
Oct 15	*Datacamp Assignment 3 due: Time Series Analysis in R*
Oct 15	In-person class – review of exponential smoothing
Oct 17	*Practical Assignment 2 due*
Oct 22	In-person meeting**:** Review for Exam 2
Oct 29	**Exam 2 – Mandatory** in-person exam administration
Nov 4	*Last day to withdraw from this course*
Weeks 10-11	Chapter 8: ARIMA Models (lecture and notes posted online)
Nov 5	*Datacamp Assignment 4 due: ARIMA models in R*
Nov 12	**Mandatory** in-person meeting**:** Practical Exercise - Fitting and evaluating various time series models + Lab Exercise for non-seasonal ARIMA model
Nov 19	In-person class – review of ARIMA models
Nov 25 - 29	*Thanksgiving holidays. Gobble! Gobble!*
Weeks 13-14	Chapter 12: Some Practical Forecasting Issues (lecture and notes posted online)
Dec 3	*Practical Assignment 3 due*
Dec 3	In-person research presentations **(Mandatory for FINA 5347 students only)**
Dec 5	*Datacamp Assignment 5 due: Forecasting in R*
Dec 5	In-person meeting**:** Review for exam 3
Dec 12	**Exam 3 – Mandatory** in-person exam administration

EVALUATION:

A student's grade for the class will be based on performance in exams, project assignments, and the level of participation in class. Below are the weights for the different components that comprise your grade in class.

FINA 4357 students

Component	Weight
Exams	45%
Datacamp Assignments	35%
Practical Assignments	15%
Class participation	5%

FINA 5357 students

Component	Weight
Exams	45%
Datacamp Assignments	25%
Practical Assignments	12%
Graduate Research Paper	15%
Class participation	3%

GRADING SCALE

A standard 10-point scale is utilized to assign grades in class. The following is the scheme used to assign letter grades based on the overall weighted score received by a student from the various activities described above.

Weighted Total Score	Grade
Greater than 90%	A
80% to less than 90%	B
70% to less than 80%	C
60% to less than 70%	D
Less than 60%	F

ARTIFICIAL INTELLIGENCE POLICY

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the

guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, **AI is permitted only for specific assignments or situations, and appropriate acknowledgment is required.**

Most assignments in this course will permit using artificial intelligence (AI) tools, such as ChatGPT or Copilot. When AI use is permissible, it will be in the assignment description, and all use of AI must be appropriately acknowledged and cited. When using AI tools for assignments, add an appendix showing (a) the entire exchange (e.g., prompts used), highlighting the most relevant sections; (b) a description of precisely which AI tools were used, (c) an explanation of how the AI tools were used (e.g. to generate ideas, elements of text, etc.); and (d) an account of why AI tools were used (e.g. to save time, to surmount writer's block, to stimulate thinking, to experiment for fun, etc.). Students shall not use AI tools during in-class examinations or assignments unless explicitly permitted and instructed to do so.

OTHER UNIVERSITY POLICIES:
Please see the appropriate links from the Syllabus page in your Canvas course to access information regarding policies and resources made available to you on the web by the University.