Course Syllabus

Course Information

Course Number/Section	**FIN6318**
Course Title	*Analytics of Finance*
Term	2022 fall
Class time	1:00pm-3:45pm
Class location	JSOM2.903

Professor Contact Information

Professor	Dr. Liping Ma
Office Phone	972-8835068
Email Address	Liping.Ma@utdallas.edu
Office Location	JSOM14.208
Office Hours	2:00pm-4:00pm, Wednesday

Note: I check my email messages daily Monday through Friday and reply to you within a day, you can be sure I will receive your message this way. If you did not receive my message after 24 hours, contact with me on Microsoft teams or call my office phone and leave messages.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Pre-requisite or Co-requisites: Fin 6307 (or Stat 5311), and Fin 6301. If you have not completed all of the prerequisites or obtained an official waiver you may not register for this class.

Course Description and Student Learning Objectives/Outcomes

This course will cover a sequence of topics in statistical modeling and financial data analysis. The topics will be divided into three categories. First of all, we will introduce data exploratory analysis and visualization, data transformation and engineering in modeling, the BLUE estimator properties in multiple regression models, the violation of underlying assumptions and potential remedies. Secondly, the forecasting models will be introduced, including stationary property of time series data, ARIMA models, and VAR models. We also learn the dynamics volatility models such as ARCH and GARCH. The last section will cover simulation techniques in trading strategies and model validation. We also cover the generalized linear models for limited dependent variables such as Logit and Probit and the application of credit risk modeling.

The course will use R programming in all analysis procedures. This course will prepare you not only solid foundation of statistical modeling and forecasting, but teach you computing skills through all sorts of data and case study. You will expect many hand-on exercises in and outside of class.

Course Objectives: This course will primarily focus on building quantitative and analysis skills and applying in financial data including investment decision, and trading strategies.

1. Validate assumptions underlying the regression analysis and understand consequences and remedies to different violations to these assumptions
2. Implement different estimation techniques and perform statistical inference
3. Analyze dynamics of time-series and apply different forecasting techniques
4. Understand heteroscedasticity and estimation of different volatility models
5. Explore other analytical tools used in finance, including simulation and credit risk models.

Required and Suggested Textbooks:

1. Required: "**Introductory Econometrics for Finance**", 4th Edition, by Chris Brooks, Cambridge

Notes: Additional reading materials will be posted on eLearning. Some of the papers will be discussed in class.
Textbooks and some other bookstore materials can be ordered online or purchased at the UT Dallas Bookstore.

Technical Requirements
Computers & Software: We will be using ***laptop computers*** during classes to work on some examples and models. We will also learn some basic programming techniques in R.

In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the Getting Started with eLearning webpage.

Course Access and Navigation
This course can be accessed using your UT Dallas NetID account on the eLearning website.

Please see the course access and navigation section of the Getting Started with eLearning webpage for more information.

To become familiar with the eLearning tool, please see the Student eLearning Tutorials webpage.

UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The eLearning Support Center includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Communication
This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used

during the semester. For more details, please visit the Student eLearning Tutorials webpage for video demonstrations on eLearning tools.

Student emails and discussion board messages will be answered within 3 working days under normal circumstances.

Distance Learning Student Resources
Online students have access to resources including the McDermott Library, Academic Advising, The Office of Student AccessAbility, and many others. Please see the eLearning Current Students webpage for more information.

Server Unavailability or Other Technical Difficulties
The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online eLearning Help Desk. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Academic Calendar

WEEK/ DATES	TOPIC/LECTURE	READING	ASSESSMENT / ACTIVITY
1 08/22-08/26	Basics of Data Structure		(Self-introduction and group sign-up)
2 08/29-09/02	Introduction to Econometrics and R Programming, Wring R functions	Chapter 1&2	
3 09/05-09/09	BLUE Estimators in multiple regression models	Chapter 3	Assignment 1
4 09/12-09/16	CLRM and Hypothesis Test, Model Specification and violations of the model assumptions.	Chapter 4	Quiz 1
5 09/19- 09/23	Heteroscedasticity issue in modeling and approaches to fix the problem, Indicator Variables	Chapter 5	Assignment 2

WEEK/ DATES	TOPIC/LECTURE	READING	ASSESSMENT / ACTIVITY
6 09/26-09/30	**Paper presentation**		**09/29**
7 10/04-10/08	ARIMA and forecasting	Chapter 6	Quiz 2
8 10/10- 10/14	**Mid-term EXAM**		**10/13**
9 10/17- 10/21	Multi-series and VAR models	Chapter 7	
10 10/24- 10/28	Long-term relationships and Co-integration	Chapter 8	Assignment 3
11 10/31- 11/04	Long-term relationships and Co-integration	Chapter 8	Quiz 3
12 11/07- 11/11	Modeling Volatility and GARCH	Chapter 9	
13 11/14- 11/18	Modeling Volatility and GARCH	Chapter 9	Assignment 4
14 11/21- 11/25	Limited Dependent Variable models and its application in credit risk analysis	Chapter 12	Quiz 4
15 11/28-12/02	Limited Dependent Variable models and its application in credit risk analysis	Chapter 12	
16 12/05- 12/08	**Project presentation**		**12/08**

Grading Policy

Students earn a grade in the class by demonstrating *mastery of the class material*. Grades will be based on an end-of-semester ranking of students according to the total accumulated score. Both the total score and students' respective rankings will be used in assigning final grade. The precise cutoff scores used to assign grades will be an end-of-semester decision based on my perception of the difficulty of the exams and class works and other factors that I consider appropriate. The letter grades will be given by the overall percentage grades.

Assignments	Points
Quizzes, HW and paper presentation	100
Exam 1	100
Project	100
Total	300

Grade	Description	Grade Points per Semester Hour
A	94+	4
A-	90-93	3.67
B+	86-89	3.33
B	80-85	3
B-	76-79	2.67
C+	70-75	2.33
C	60-69	2
F	Failure	0

Assignments: Students are randomly formed into groups. Students are randomly formed into groups. Each team will have 3-4 students. Every member should actively participate and contribute to the group assignments. All assignments should be submitted by eLearning and late submission is not accepted.

Course Policies

Make-up exams

There will be no make-up exams. You are responsible for taking all exams on the designated dates.

Quizzes

Four quizzes will be given through the semester. There are no make-up quizzes.

Extra Credit (it should be completed in fall term)

Get **10 points** added to grade.

The requirements are posted on eLearning.

Late Work

Late submission was not acceptable. It will take zero automatically for all assignments.

Classroom Citizenship

Student Conduct and Discipline: The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student Services and Activities of the university's Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff

members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

Academic Integrity: The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings. Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to UT Dallas Syllabus Policies webpage for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.