



Course Syllabus

Department

BA 522 Numerical Methods for Advanced Finance (Multivariate Financial Time Series Econometrics) Spring 2021

Course Instructor: Erhan Muğaloğlu, PhD

E-mail: erhan.mugaloglu@agu.edu.tr

Office/Phone: Taş Ofis(Eski SKS) No:1-

Office Hours: Wednesdays: 15:00 p.m. – 16:00 p.m., or by appointment

Course days and hours:

Location:

Course Credit: 3 (? ECTS, please check course catalogues)

Course Prerequisites: [ba521](#)

Required Software: (1) R open source, R studio

(2) Stata 15

Suggested Textbooks: (1) Tsay, R. S. Multivariate Time Series Analysis, 2010.

(2) Tsay, R. S. Analysis of Financial Time Series, 2005.

(3) Hamilton, J. D. (1994). Time series analysis (Vol. 2, pp. 690-696). Princeton, NJ: Princeton university press.,

(4)Tsay, R. S. (2014). An introduction to analysis of financial data with R. John Wiley & Sons.
(Main Textbook)

(5) Box, G. E., Jenkins, G. M., Reinsel, G. C., & Ljung, G. M. (2015). Time series analysis: forecasting and control. John Wiley & Sons.

Teaching Methodology: Learners will be provided with as much opportunities of hands-on practice as possible with the aim of striking a balance between learner-centeredness and sufficient guidance. Various forms of interaction (i.e. pair work and group work) will also be encouraged to cater for learners with different learning styles. Additionally, individuals will be expected to produce both in-class writings and homework assignments in addition to the reading tasks, which will encourage them to reflect and think critically. Technology will also be incorporated into the classroom procedures in order to create a better learning environment.

Grade Distribution: *Final grades are based on the following*

<u>Evaluation Criteria</u>	<u>Percentage</u>
Midterm exam (1 in total)	30%
Final Exam	70%

Total: 100%

Grading Scale:

A	4,00	90-100
A-	3,67	87-89
B+	3,33	83-86
B	3,00	80-82
B-	2,67	77-79
C+	2,33	73-76
C	2,00	70-72
C-	1,67	64-69
D+	1,33	56-63
D	1,00	50-55
F	0,00	0-49

For a detailed description of grading policy and scale, please refer to the website <https://goo.gl/HbPM2y> section 28.

Course Policies:

- For the AGU Make-up policy, please refer to the website <https://goo.gl/HbPM2y> section 26.
- Please, no eating in class
- English should be used at all times to communicate with one another during instruction hours.
- Please, respect the allotted times provided for breaks.
- Cell phones must be turned off and put away during class. Personal computers are only to be used during in-class lab times and only for class assignments. Unless it is part of the lecture time activity assigned by the instructor, do not use the computer. When using the computer do not surf on the web or write personal emails, etc. Consequences include but are not limited to loss of participation points, extra assignments, and/or being asked to leave the classroom.
- Please, bring the required materials, including textbooks and notebooks.
- Please be prepared, having read, written and studied the assigned lessons, articles, or passages;
- Please be ready to write assignments in class that will be graded; and most importantly work cooperatively with other students.

Attendance Policy:

- Be in the class on time (being late for class is an extreme annoyance to the entire class).
- Class attendance is strongly recommended and will count toward your participation grade. Regular class time will include informal assessment activities for which points will be assigned. Participation in these activities will help you prepare for exams and

homework and also provide me with feedback on your progress.

- For a detailed description of AGU attendance policy, please refer to the website at <https://goo.gl/HbPM2y> section 25.

Email Policy:

When contacting the instructor or the course assistant, please use the Canvas email feature. Only use my `firstname.lastname@agu.edu.tr` if Canvas is not accessible (server down, etc). Include in the subject line the class and section number (CISXXX, Section XXXX). If this information is not included, your email may not be answered. Any announcements or warnings will be send to your AGU e-mail. Therefore it is the responsibility of every student to read his/her AGU e-mails and CANVAS emails regularly. AGU webmail can be accessed through <https://mail.agu.edu.tr>

Cheating & Plagiarism:

You are responsible for knowing the University policies on cheating and plagiarism. Not giving credit to a person for their intellectual work and passing it off as your own is stealing.

Specifically:

- 1) Copying or allowing someone to copy your work on an exam, homework, or in class assignment is cheating.
- 2) Cutting and pasting material from the web or any other electronic source is plagiarism.
- 3) Copying and turning in the same assignment as someone else, from this class or from another class, is cheating. Unless explicitly told otherwise, you can discuss and problem- solve on homework together but the final product has to be your own – not just your own handwriting but your own way of explaining and organizing your ideas.
- 4) Making superficial changes (minor additions, deletions, word changes, tense changes, etc) to material obtained from another person, the web, a book, magazine, song, etc. and not citing the work, is plagiarism. The idea is the intellectual property, not the specific format in which it appears (e.g., you wouldn't reword Einstein's theory of relativity and imply that relativity was your own idea, would you?)
- 5) If you find material and it is exactly what you are trying to say, or you want to discuss someone's idea, give the person credit and cite it appropriately. Don't overuse citations and quotes: instructors want to know how you think and reason, not how some one else does.

If you have any questions or concerns about whether your behavior could be interpreted as plagiarism, please ask the assistants or me before you submit the work.

For a detailed description of AGU policies, please refer to the website at <https://goo.gl/FjLhzH>

Course Outline:

Week	Date	Topic	
1st		<i>Fundamental Concepts in Financial Econometrics</i>	
2nd		<i>Volatility Modeling</i>	
3rd		Asymmetric Volatility Models	
4th		Forecast Performance Evaluation	
5th		<i>Vector Autoregressive Models (VAR)</i> <i>Vector ARMA models (VARMA)</i>	
6th		<i>Granger Causality</i>	
7th*		<i>LFW (Video Lectures from Nobel Laureates in Economics)</i>	
8th		Mid Term Exam	
9th		<i>Impulse Response Functions (IRF's)</i>	
10th		Spring Break	Spring Break
11th		<i>Co-Integration and Error Correction Mechanism</i>	
12th		Co-Integration Testing	
13th		Vector Error Correction Models	
14th		<i>Multivariate Volatility Models</i>	
15th**		Autoregressive Disturbed Lag Model -ARDL, Dynamic Regressions	
16th		Final Exam Week	Final Exam

* Non-stationarity revisited -Unit Root Testing, Granger video

**If time permits.