ECMT 475 Section 500: Economic Forecasting

Term: Spring 2024

Instructor: Craig Schulman
Telephone numbers: 979 599-9229 (off-campus office), 979-324-5988 (mobile)
Email address: cschulman@tamu.edu
Office hours: I will hold virtual office hours via Zoom by appointment on Wednesdays.

Meeting times and location: Tuesday and Thursday 11:30 am – 12:45 pm in ALLN 1004

TA: Vladislav Abramov, vabramov@tamu.edu, Zoom office hours TBD.

Course Description:
This course is meant to be taken after introductory economic statistics and undergraduate econometrics. The course focus is on the empirical application of econometric techniques to prediction in economics. Topics such as basic regression, model building and specification, and hypothesis testing will be reviewed, followed by an in-depth examination of various modern forecasting techniques with a heavy emphasis on time series econometric analysis. The course materials, including the required text noted below, and homework assignments will rely on the statistical software package R and GRETL.

Prerequisites: ECMT 463 with a C or better; junior or senior classification

Student Learning Outcomes
The goal is for students to learn:
- The basic tools of time-series analysis to be able to postulate and estimate a model, conduct hypothesis testing, construct predictions and prediction intervals, evaluate predictions;
- the software environment R and GRETL which is used for statistical computing and graphics, become comfortable using it for econometric analysis.

Text and Other Readings
Recommended:
- Hyndman, Rob J. and Athanasopoulos, George, Forecasting: Principles and Practice, 2nd Edition, Online, Open-Access Textbooks, 2018. Available as an open-access text at: https://otexts.com/fpp2/
Optional:
- Wooldridge, Jeffrey M., Introductory Econometrics, 6th edition, South-Western, 2016.
- Enders, Walter, Applied Econometric Time Series, 3rd edition, Wiley, 2009
- Selected additional readings will be made available as needed.

Online class materials and resources
Class website: http://people.tamu.edu/~cschulman/   I will post homework sets, data, and other course information on this website.
CANVAS: You will be required to submit your homework assignments and term project assignments to this system.

References for R and GRETL

R is an open-source software, typically used for statistical computing and graphics. R runs on many operating systems, including Linux, MacOS and Windows, and since it is an open-source software, there are many packages developed for it by a variety of contributors.

To get started with this class, you need to install the R statistical software and the RStudio environment, which we will use to write code, plot, and manage data.

There are several useful (and free with a TAMU NetID via TAMU libraries) references for R. They are listed below – this list is not meant to be an exhaustive list, but rather a useful one:

Cowpertwait, P.S.P. and A.V. Metcalfe. *Introductory Time Series Analysis with R*, Springer, 2009 (link)
Kleiber, C. and A. Zeileis. *Applied Econometrics with R*, Springer, 2009 (link)
Saiz, Alfonso Z, et. al., *An Introduction to Data Analysis in R,* Springer, 2020 (link)
Sebastiano, M. *Introduction to Financial Econometrics*, 2017 (link)
Tsay, Ruey S. *An Introduction to Analysis of Financial Data with R*, Wiley, 2013 (link)
Zuur, A.F., Ieno, E.N. and E.H.W.G. Meesters. *A beginner's Guide to R*, Springer, 2009 (link)

GRETL is also an open-source regression software that is available for both Windows and MacOS and is very point-and-click friendly. It is available at http://gretl.sourceforge.net/.

Your E-mail Address: Every student must have a functioning TAMU e-mail address, and you must be reachable through that address. Your TAMU e-mail address must be the address that accompanies the official TAMU on-line class roll.

Course Policies:
Grading:

Homework Assignments	15%
Exams (combined)	60%
Term Project	25%

Grades will be distributed as follows: A: 90%-100%; B: 80%-89.99%; C: 70%-79.99%; D: 60%-69.99%; F: below 60%

Homework Assignments:
For homework assignments (tentatively 6) I encourage you to work with your fellow classmates. Nonetheless, each student must submit their own homework in Canvas by the assigned due date. All the assignments will involve the use of R and/or GRETL. In addition to these packages, we will make considerable use of MS Excel. These assignments are designed to help you learn the material and prepare for the exams. I'll post the problem sets and their solutions on the course website.

Exams:
The exams will be short-answer problem solving format. Anything covered in lecture, homework, or the readings is fair game. However, I will post study guides for the exams to identify the material you are responsible for. Tentative exam dates are provided on the class schedule below. If you know in advance that you have a conflict with one of the exam times, please see me as soon as possible so that we can work out an alternative. No make-up exams will be given without a university-approved and documented excuse. Student

Rule 7 governs attendance policy and excused absences. Non-excused absences will result in a zero for that portion of your grade. If you think there has been a mistake in the grading of your exam, please contact me no later than one week after the exam is returned. I reserve the right to re-grade the whole work, meaning that you may lose points (since mistakes can happen in both directions).

Term Project:
The Term Project is a Team Based assignment. I will assign teams with 3-4 students on each team. The focus of the project will be forecasts of county level economic activity for a specific Texas county. The final project report should include a discussion of the objectives of the forecasting exercise, the econometric analysis undertaken as part of that exercise and how the analyses address the initial objectives of the project. Final reports will be due in Canvas on **Tuesday April 30th**. We will use our final exam period **(Thursday May 2, 3 – 5 pm)** for in-class presentations of the Term Project by each team; an 8–10-minute presentation to the class followed by a brief question and answer session.

Other resources:
• http://writingcenter.tamu.edu/
• http://www.economics.harvard.edu/files/WritingEconomics.pdf
• http://lupus.econ.duke.edu/ecoteach/undergrad/manual.pdf
• http://www.economicsnetwork.ac.uk/archive/lse_writing/

General Course Expectations:
I will not enforce a formal attendance policy, but the best grades are historically earned by those who are active, engaged, and in class. If you miss a class, it is your responsibility to catch up with the material. Ask your fellow classmates for notes. If you cannot attend several classes, it is a good idea to email or talk to me and your section TA as soon as you can. As a courtesy to me and to your fellow students, please arrive on time and turn off your cell phones. If you absolutely must leave a class early, let me know in advance to minimize distractions. Please do not read newspapers, social media, or other material unrelated to the subject matter of the day. Please do not sleep in class or litter.

AMERICANS WITH DISABILITIES ACT (ADA) POLICY STATEMENT
Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact the Disability Resources office on your campus (resources listed below) Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible. If you believe you have a disability requiring an accommodation, please contact Disability Services, located in the Student Services Building or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality
Texas A&M University and the College of Liberal Arts are committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws provide guidance for achieving such an environment. Although class materials are generally considered confidential pursuant to student record policies and laws, University employees — including instructors — cannot maintain confidentiality when it conflicts with their responsibility to report certain issues that jeopardize the health and safety of our community.

As the instructor, I must report (per Texas A&M System Regulation 08.01.01) the following information to other University offices if you share it with me, even if you do not want the disclosed information to be shared:

• Allegations of sexual assault, sexual discrimination, or sexual harassment when they involve TAMU students, faculty, or staff, or third parties visiting campus.

These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In many cases, it will be your decision whether or not you wish to speak with that individual. If you would like to talk about these events in a more confidential setting, you are encouraged to make an appointment with Counseling and Psychological Services (https://caps.tamu.edu/).

Students and faculty can report non-emergency behavior that causes them to be concerned at http://tellsomebody.tamu.edu.

STATEMENT ON MENTAL HEALTH AND WELLNESS

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.

STUDENT LEARNING OUTCOMES

Texas A&M University has identified student learning outcomes that describe our institutional commitment to your education goals. These include the ability to demonstrate critical thinking, effective communication, and social, cultural, and global competence. Please see http://provost.tamu.edu/essentials/pdfs/copy_of_UndergraduateLearningOutcomesFinal.pdf/view

Academic Integrity

Note that plagiarism is a type of academic dishonesty and will not be tolerated. Students caught plagiarizing will receive an F on their paper and will fail the course.

For additional information on the Aggie Honor Code and academic integrity, please visit: http://aggiehonor.tamu.edu

"An Aggie does not lie, cheat, or steal or tolerate those who do."

Course Topics, Calendar of Activities, Major Assignment Dates
This schedule may be revised as circumstances dictate. I will keep you informed if we deviate from the schedule.

Week of	Tuesday	Thursday	Homework Due in Canvas
1/15/2024	Snow/Ice Day	Introduction: Why Forecast?	a
1/22/2024	Introduction to R	Review of Statistics and Regression	Homework #1
1/29/2024	Exploring Time Series Data	Time Series Graphics	Homework #2
2/5/2024	Time Series Decomposition	Deterministic Trend and Seasonality	a
2/12/2024	Trend Breaks and Spline Functions	Review for 1st Exam	Homework #3
2/19/2024	Exam #1	Exponential Smoothing	a
2/26/2024	Exponential Smoothing	Exponential Smoothing	Homework #4
3/4/2024	ARIMA Models	ARIMA Models	a
3/11/2024	**SPRING BREAK**	**SPRING BREAK**	a
3/18/2024	ARIMA Models	Combining Trend, Seasonal and Cyclical Components	Homework #5
3/25/2024	Review for 2nd Exam	Exam #2	a
4/1/2024	Multivariate Models - Vector Auto-Regression	Multivariate Models - Vector Auto-Regression	a
4/8/2024	Non-Stationary Time Series	Co-Integration	Homework #6
4/15/2024	Modeling Volatility: ARCH and GARCH	Review for 3rd Exam	a
4/22/2024	Exam #3	Last Day of Class: Term Project Q&A	a
4/29/2024	No Class: Redefined Day. **Term Project Reports due in Canvas**	**In-Class Term Project Presentations: Thursday May 2, 3 - 5 pm**	a