Syllabus

Course Information:	ECON/FINC 4505 - Special Topics in Forecasting
	CRN 80206/81704
<u>Time</u>:	TR 3:30pm - 4:45pm
<u>Room</u>:	Atkinson Hall 108
Professor:	Dr. Alexandre Scarcioffolo
Office:	421 Atkinson Hall
Office Hours:	M W 1-2 pm & T 9am-11am and by appointment
Meeting room	https://gcsu.webex.com/meet/alexandre.scarcioffolo (120 827 2617)
Email:	alexandre.scarcioffolo@gcsu.edu
Phone:	478-445-1804 (Office)

Course Description: The objective of the course is to introduce students to time series analysis and forecasting. The goal of this course is for students to obtain a hands-on experience with using financial, economic, business, crime, traffic, and other data to construct and evaluate forecasts. The class will introduce several forecasting techniques such as decomposition of time series, exponential smoothing methods, regression, ARIMA and GARCH modelling. Students will be using R to enhance their computer skills.

The course will primarily consist of lectures combined with in-class "Labs". Additionally, across the semester, we will have guest lectures to show the application of forecating techniques in the real world and give students an opportunity to ask questions to experts.

Expected Learning Outcome:

- Understand common statistical methods used in business and economic forecasting;

- Develop computer skills for forecasting business and economics time series data;

- Identify, collect, and organize relevant data useful for forecasting.

- Provide insights into the problems of implementing and operating large scale forecasting systems.

- Interpret the results and write a basic report useful for management for decision making.

Prerequisite: ECON 2105 & 2106, or ECON 2100, and MATH/2600

Required Readings:

- (HA) Hyndman, R.J., Athanasopoulos, G. (2018) Forecasting: principles and practice, 3nd edition, OTexts: Melbourne, Australia - https://otexts.com/fpp3/

- (FD) Francis X. Diebold, Forecasting in Economics, Business, Finance and Beyond - https://www.sas.upenn.edu/~fdiebold/Teaching221/Forecasting.pdf

- (GH) Garrett Grolemund and Hadley Wickham (2016) R for Data Science - https://r4ds.had.co.nz/index.html

Software:

- R - https://cran.r-project.org/

- RStudio https://www.rstudio.com/products/rstudio/download/

General Course Policies and Expectations:

- I do not generally take attendance; however, attending class is crucial to understanding the material and thus doing well in the course.

- The exams will cover the in-class notes and assigned reading material.

- I will take attendance on presentation days, and you will lose points for being late or absent without a valid excuse.

- Reading the textbook and material before coming to class is **ESSENTIAL**.

- Please visit me during office hours if questions remain after reading the relevant Ch and attending the related lecture. **I am a resource for you!!!**

- Students should check the school email regularly as these will be the primary forms of mass communication with the class.

Grading: Grading in this course will consist of a mixture of exam, homework, "weekly forecast", project, and presentation. These assessments will result in a total of 1000 points possible in the course.

Grade Breakdown

Assignment	Max. Points
Exam	320
Homework	280
Weekly Forecast	100
Project	200
Presentation	100
Total	**1000**

Grading Scale

Score	Letter Grade
900–1000	A
800–899	B
700–799	C
600–699	D
000–599	F

Exam: There will be two exams for the course, each worth 160 points. The first exam will be divide into two parts. The in-class part will be taken in regular classroom (pen and paper). For the take-home part, students will work on the computer. Students will have 24 hrs after I post the exam to submit their answer. The second exam will be taken in regular classroom (pen and paper).

Project: Students will engage in a semester-long project. Each student will choose a variable of interest to forecast over the next 12 periods ahead. This activity is designed to give you first-hand experience in applying your skills, develop your data analysis expertise, and challenge you to find modeling techniques that are appropriate for your data. Details about the project will be posted on GAview. Students are expected to write a report of 8-10 pages, excluding figures, tables, references, and so on. Each student will present their results in a 8–10 minute presentation to the class. The presentations is scheduled during the finals week. Rubrics will be posted on GAView.

Homework: There will be 7 homework, each worth 40 points. Assignments will be due at the beginning of class. It will be a mix of programming and open questions. There will be NO LATE ASSIGNMENTS ACCEPTED FOR ANY REASON. The collaboration of students to complete the homework is encouraged, however, each student must turn in his/her own homework. I **will not** accept group homework under any circumstances.

Homework Schedule

HW#1	2-Sep
HW#2	16-Sep
HW#3	28-Sep
HW#4	7-Oct
HW#5	28-Oct
HW#6	11-Nov
HW#7	18-Nov

Forecast Exercise: Students will forecast one variable which will be posted on GAView. There are 5 forecast activities, each worth 20 points. You need to submit a forecast for next period and a short paragraph explaining what factors you believe are important to consider for this particular variable. Your report should reflect your building knowledge, i.e., your report should be more insightful as the semester progress. You should not spend more than a couple of hours researching and thinking about these forecasts. I will ask students to submit 2 ideas of potential variables in the first week of class. Please make sure there is data available for your potential variables.

Forecast Schedule

Forecast#1	29-Aug
Forecast#2	19-Sep
Forecast#3	5-Oct
Forecast#4	26-Oct
Forecast#5	9-Nov

Activity Submission: All activities such as HW and Forecast, students should produce them via R Markdown and published at Rpubs (each student will create an account) Additionally, each document should be labeled according to the name of the activity. For example, if I am to publish the first forecast activity, I should save my document at Rpubs as **forecast1**. After publishing your document, you only have to submit the link via GAView. We will work together to make sure everybody knows how to use Rmarkdown and Rpubs.

I will not accept any other type of activity submission

I reserve the right to award, at my discretion, extra credit for class attendance, extra credit quizzes, and any other various and sundry academic events and activities throughout the course of the semester. These extra credit opportunities will be announced as appropriate.

Contacting the Instructor and Email Etiquette:
The best time to ask questions is in class! Outside of class, the best way to reach me is via email. I will respond to emails in a timely manner – in most cases within a few hours. However, be aware that you are unlikely to get responses outside of regular business hours.

Professional email communication is an important skill for career success. I will always send professional emails when communicating with the class or with individual students and I expect that you will do the same when contacting me. When sending me an email, please compose it in a professional manner (an example is shown below) using complete sentences. To avoid it being sent to my spam box, please also ensure that "ECON 3840" is in the subject line; in addition, I suggest sending from a GCSU email address. It is also very important that you provide your full name, as many of your email addresses do not tell me who you are.

Subject: ECON 4505
Alex,
I am a student in your ECN4505 class and I would like to set up an appointment on Thursday, 1/10, to discuss the material covered in class last week. I am available from 9 a.m. to 1:30 p.m.
Thank you.
Jane Doe

COVID-19 Statement: The health and safety of our community will always remain our top priority. Although not required, **we strongly encourage students to get a COVID19 vaccine**. Similarly, unvaccinated individuals are also strongly encouraged to continue wearing a mask or face covering in the classroom as well as at social gatherings. Vaccinated individuals may also want to consider wearing a mask or face covering while indoors. In an effort to assist students with getting vaccinated, Student Health Services will be offering on-going vaccination clinics on campus starting during our Weekend of Welcome. For more information, contact Student Health Services at 478-445-3142 or via Email. Please consult the university's website for COVID related updates and resources.

GC Keeps Learning: To help students adapt to the changing learning environment, Georgia College has developed a website of resources, tips, virtual tools, and access to help. Included in this site are tutorials for GeorgiaVIEW, area access to Wi-Fi, academic support tools, and tips for online learning (`https://www.gcsu.edu/gckeepslearning`).

Writing Center: Aside from one-on-one meetings with teachers during office hours, the best way to improve your writing is to work with writing consultants at the Writing Center. Writing consultants will work with any student writer working on any project in any discipline. To learn more about Writing Center locations, hours, scheduling and services, please go to `https://www.gcsu.edu/writingcenter`.

Academic Dishonesty: The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of Georgia College & State University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code. Any student who commits any act of academic dishonesty will automatically receive a grade of "F" in this course.

Lauren's Promise

I will listen and believe if someone is threatening you

Lauren McCLuskey, a 21-year-old honors student athlete, was murdered on 2018 by a man that she briefly dated on the University of Utah campus. **We must all take action to ensure that this never happens again.**

If you are in immediate danger, call 911.

If you experiencing sexual assault, domestic violence, and/or stalking, please report it to the Title IX Coordinator by calling the Office of Legal Affairs at (478) 445-2037 during business hours. You can also call Georgia College Police at (478) 445-4400 (emergency assistance) to report a possible assault. Off-campus resources include the Crisis Line and Safe House of Central Georgia, their 24/7 hotline number is (478) 745-9292 and the Bright House at (478) 250-8566, their 24/7 crisis hotline number is (770) 477-2177. You can also contact Counseling Services during business hours at (478) 445-5331. For confidential reporting options, please visit this https://www.gcsu.edu/titleix/filing-complaint.

Schedule

Day	Activity	Chapter/Book
15-Aug	Syllabus Day	
17-Aug	Stats Review/Intro to R	Chapter 1 (HA) and Chapter 1-8 (GH)
22-Aug	Stats Review/Intro to R	Chapter 1 (HA) and Chapter 1-8 (GH)
24-Aug	Stats Review/Intro to R	Chapter 1 (HA) and Chapter 1-8 (GH)
29-Aug	Time Series Graphics	Chapter 2 (HA) and Chapter 1-8 (GH)
31-Aug	Time Series Graphics	Chapter 2 (HA) and Chapter 1-8 (GH)
5-Sep	**Labor Day**	**NO CLASS**
7-Sep	Time Series Decomposition	Chapter 3 (HA)
12-Sep	Data Visualization	Chapter 3 (HA)
14-Sep	Data Visualization	Chapter 3 (HA)
19-Sep	Forecasters toolbox	Chapter 5 (HA)
21-Sep	Forecasters toolbox	Chapter 5 (HA)
26-Sep	Forecasters toolbox	Chapter 5 (HA)
28-Sep	Time Series Regression	Chapter 7 (HA)
3-Oct	Time Series Regression	Chapter 7 (HA)
5-Oct	Time Series Regression	Chapter 7 (HA)
10-Oct	**Fall Break**	**NO CLASS**
12-Oct	**OPEN**	**OPEN**
17-Oct	**Exam#1**	In-class (bring your laptop)
19-Oct	Exponetial Smoothing	Chapter 8 (HA)
24-Oct	Exponetial Smoothing	Chapter 8 (HA)
26-Oct	Exponetial Smoothing	Chapter 8 (HA)
31-Oct	ARIMA	Chapter 9 (HA)
2-Nov	ARIMA	Chapter 9 (HA)
7-Nov	ARIMA	Chapter 9 (HA)
9-Nov	ARIMA	Chapter 9 (HA)
14-Nov	Dynamic Regression Models	Chapter 10 (HA)
16-Nov	Dynamic Regression Models	Chapter 10 (HA)
21-Nov	**SEA Conference**	**NO CLASS**
23-Nov	**Thanksgiving**	**NO CLASS**
28-Nov	**Exam # 2**	In-class (bring your laptop)
30-Nov	Final Exams/Paper submission	
5-Dec	OPEN	
7-Dec	Presentation - 3:30 pm-5:45 pm	