Financial Econometrics
FIN 657, Fall 2026
Goizueta Business School, Emory University

Instructor: William Mann (william.mann @ emory)

Office hours: Mondays, 1:00pm to 3:00pm. You can come to my office (512 in the Goizueta building), or log in via Zoom (link is on Canvas). You can also email me with questions.

Course overview: This course surveys statistical techniques for financial and macroeconomic data.

Our major focus will be on time series econometrics, which is the branch of statistics that models how processes evolve over time, and how their values at any two dates are potentially connected to each other. A major application of time series econometrics is developing techniques for *forecasting* data that rely mainly on information about their recent values, rather than economic insights.

We will start with forecasting techniques based on *smoothing*, which are very popular and easy to apply in practice. Then we will switch to model-based analysis with the ARMA framework. This framework delivers comparable forecasts to the smoothing approach, but with a clearer grounding in statistical theory and more opportunities for analysis beyond pure forecasting. Finally, we will cover models of volatility. These can also be divided into smoothing-based and model-based approaches.

Course webpage: If you are enrolled in the course, you should automatically receive access to the course Canvas page. I use Canvas extensively, so please be sure that you have access, and that you are set to receive email notifications about any announcements that I might send.

Technology: The class is in Python, with extensive use of the `statsmodels` library, which in turn is built on the standard libraries `numpy`, `scipy`, and `pandas`. Our specific environment will be iPython notebooks in Jupyter. Our visualizations will use the `pyplot` library in `matplotlib`. We will pull data by API from two sources: FRED for macroeconomic data, and WRDS for financial data.

All course files are available by cloning the course repo on Github. **Before the first class**, please follow the steps listed on that page to clone the repo and set up your Conda environment. Then make sure you can open and run `Preliminary.ipynb` without any errors. If so, you should be configured properly for the whole course.

Course grade: Your grade will be based on four homework assignments completed **individually.** Each homework is worth 25% of the overall course grade. You download each homework from Canvas, and submit it back to the same location before the start of class on the dates listed on the next page.

Accommodation: Students who require accommodation for access and participation should make arrangements before the course starts with Emory's Department of Accessibility Services.

Textbook: Because this is a short course, I will not refer to any specific textbook nor ask you to obtain one. All necessary materials will be posted on the Canvas course website.

Honor code: Any instances that appear to violate the Honor Codes of Emory University or its Goizueta School of Business will be referred to the appropriate Honor Council and handled by that body.

This version: January 8, 2026

Below is a list of topics we will cover in each class, along with the filenames of the slides and notebooks that we will use. These materials are posted on the course Canvas page.

Date	*Plan*

Mon, Oct 19 / Wed Oct 21	**Overview, moving-average smoothing, seasonal decomposition.**
	`Preliminary.ipynb`
	`Moving-average smoothing.pdf`
	`MA smoothing and seasonal decomposition.ipynb`

Mon, Oct 26 / Wed, Oct 28	**Forecasting approaches based on exponential smoothing.**
	`Exponential smoothing.pdf`
	`Exponential smoothing.ipynb`

Mon, Nov 2 / Wed, Nov 4	**AR(1) processes and unit-root processes.**
	`AR1 and unit root.pdf`
	`AR1 and unit root processes.ipynb`
	Homework 1 due <u>before the start of class</u> on Monday.

Mon, Nov 9 / Wed, Nov 11	**The ARMA framework.**
	`ARMA.pdf`
	`ARMA part 1 – Simulation and estimation.ipynb`
	Homework 2 due <u>before the start of class</u> on Monday.

Mon, Nov 16 / Wed, Nov 19	`ARMA part 2 – Model selection.ipynb` `ARMA part 3 – Forecasting.ipynb`
Monday, Nov 23	`ARMA part 4 – Trends and seasonality.ipynb` *Homework 3 due <u>before the start of class</u> on Monday.*
Wednesday, Nov 25	No class (Thanksgiving break)

Mon, Nov 30 / Wed, Dec 2	**Volatility models.**
	`Volatility modeling.pdf`
	`GARCH.ipynb`

Monday, Dec 7	*Homework 4 due <u>before the start of class</u> on Monday.*