

**ECON 690: Topics in Economic Forecasting**  
**Professor Mohitosh Kejriwal**  
**Spring 2021**

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*Lectures:* Tuesdays and Thursdays, 1:10-2:40pm via Zoom.

*Office Hours:* By Appointment

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*Grader:* Xuewen Yu (yu656@purdue.edu)

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*Course Overview:* This course covers a set of selected topics of current interest in economic forecasting. It is designed for students interested in conducting methodological research related to the development and evaluation of new forecasting techniques as well as those inclined towards the application of state of the art techniques to economic data. Given the breadth of the field and the length of the course, the goal is to equip students with a working knowledge of a subset of current forecasting methods in economics. Particular attention will be devoted to forecasting in a data rich environment, methods for forecast evaluation and techniques dealing with model instability. Knowledge of a matrix oriented programming language (such as MATLAB or GAUSS) is essential. It is important to emphasize that not all methods covered are available in common software packages yet and hence their implementation will require the students to develop their own program codes.

*Prerequisites:* ECON 670-673 or equivalent.

*Course Format:* The lectures will primarily involve discussion of journal articles and working papers. For instance, the discussion of a methodological paper will include the shortcomings of existing methods, assumptions and mechanics of the new method and why it works, and simulation/empirical evidence to corroborate its usefulness in applications.

*Grading:* There will be **no exams**. The evaluation for the course will be based on assignments (20%), a research project/literature review (40%), and class presentations (40%).

*Assignments:* There will be two assignments that will primarily include replication of simulation and/or empirical results from published papers. You can work in teams if you wish, not exceeding three members per team.

*Research Project/Literature Review:* You can choose to either do a research project or a literature review. The research project can be either theoretical or empirical and should include a statement of the problem and why it is important, its contribution relative to existing studies and a description of the findings. If proposing a new method, adequate

simulation evidence should be provided while if the project is purely empirical which, say, entails application of a recently developed technique to an empirical question, a detailed discussion of the econometric issues involved should be included. The literature review should be based on a topic selected from a list I will provide. It should include a section that summarizes the relevant methodological literature chronologically, a section that summarizes the relevant empirical literature chronologically, a section containing a more detailed review of two papers in the literature you find important/interesting, and a final section containing your overall views on the state of the literature and suggestions for future research. The project/review is due by **Friday, May 7**.

*Class Presentations:* Each student will present twice during the course. The first presentation will be based on a paper you will select from a list I will provide. This set of presentations will be held during the week of **April 5-9**. The second presentation will be based on your research project/literature review. This set of presentations will be held during the last week of class, **April 26-30**. Each of the two presentations should be about 25 minutes long.

*Course Website:* All material related to the course will be available through Brightspace at <https://purdue.brightspace.com/>.

*Reading Days:* There will be no class on **Thursday, March 18** and **Tuesday, April 13** as these are designated as reading days by the university.

*List of Topics (tentative):*

1. Forecasts and economic decisions: examples
2. Statement of the forecasting problem
3. Loss functions
4. Estimation of forecasting models
5. Model selection procedures
6. Forecasting with factor models
7. Forecast combinations/model averaging
8. Evaluation and Comparison of Forecasts
9. Forecasting with persistent regressors
10. Forecasting under model instability

*Suggested References:*

1. Davidson, J., *Stochastic Limit Theory*, Oxford University Press.

2. Davidson, R. & MacKinnon, J.G., *Econometric Theory and Methods*, Oxford University Press.
3. Elliott, G. & Timmermann, A. (2008), *Economic Forecasting*, Journal of Economic Literature 46, 3-56.
4. Elliott, G. & Timmermann, A. (2016), *Forecasting in economics and finance*, Annual Reviews of Economics 8, 81-110.
5. Giacomini, R. & Rossi, B. (2015), *Forecasting in nonstationary environments: what works and what doesn't in reduced-form and structural models*, Annual Reviews of Economics 7, 207-229.
6. Harvey, A.C., *Forecasting, Structural Time Series Models and the Kalman Filter*, Cambridge University Press.
7. Hastie, T., Tibshirani, R., Friedman, J., *Elements of Statistical Learning*, New York: Springer, second edition (available online through the Purdue library website).
8. White, H., *Asymptotic Theory for Econometricians*, Academic Press.

*Emergency:* In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances.