# **Tools for Modern Macroeconometrics**

**Lecturers**

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**Teaching assistant**

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**Description**

The course presents the methods relevant for applied macroeconometric work at central banks and other institutions: short-term forecasting, nowcasting, estimation of the impact of policy shocks, and modeling of spillovers. Special attention is devoted to the identification of causal relationships, time variation, and to various forms of uncertainty inherent to forecasting. All methods will be demonstrated in R.

**Moodle Site:**<http://dl1.cuni.cz/course/view.php?id=880>

**Schedule:**

1. Intro + Review of time series models (Lukáš Vácha); 15. 2.

2. Univariate models Cont.: Are univariate models relevant for forecasting? Forecasting + dealing with structural breaks (Lukáš Vácha); 22.2.

3. Spectra, cycles, and filters. (Lukáš Vácha); 1.3.

4. Evaluating business cycles in real-time. Can we predict turning points? (Jaromír Baxa); 8.3.

5. State space and dynamic factor models: Synthesize many series for predictions. (Lukáš Vácha); 15.3.

6. A primer of Vector autoregressions. (Jaromír Baxa); 22.3.

7. Structural identification with VAR models (Jaromír Baxa); 29.3.

8. Identification via sign restrictions (Jaromír Baxa); 5.4.

9. Local projections + narrative identifications (Jaromír Baxa); 12.4.

10. Modelling nonstationary variables: Identification of long-run relationships. (Jaromír Baxa); 19.4.

11. Bayesian VARs: Employing a priori information and large datasets. (Jaromír Baxa); 26.4.

12. New approaches to structural identification: Proxy SVAR + high-frequency identification (Jaromír Baxa); 3.5.

*(10.5. no lecture - rector’s day)*

13. Nonlinearities + Spillovers (Jaromír Baxa); 17.5.

**Assignment: Final paper**

Choose one country for which you will estimate the propagation of a shock of your interest and forecast the GDP growth and inflation. To do that, you will utilize the methods covered in the course and explore their properties, forecast performance, and robustness.

The final paper will be prepared throughout the whole semester, with three intermediate deadlines:

1. after lecture 4: ARIMA model of inflation and GDP, estimation of potential structural breaks, estimation of spectra of both series, forecast 1 period and 1 year ahead; evaluation of a cyclical position of the economy
2. after lecture 8: VAR I - short-run restrictions, sign restrictions + VAR forecasts.
3. after lecture 11: VAR II - local projections, Bayesian VAR + BVAR forecasts.

The outcomes of these intermediate stages will be presented and discussed during the seminars.

Detailed guidance will be provided in the following weeks.

You are encouraged to work in pairs; however, each of you shall have his/her own estimates for a particular country. The final paper can be written jointly, covering two countries as well.

Reminder: In empirical projects, success and intuitive results are never assured. Experimentation is key. Therefore, for the final paper, it is more important and valuable to describe your modeling choice carefully, defend their appropriateness, and test the robustness of your results on these choices. Those choices include a selection of variables and their transformations, identifying assumptions, and model structure. It is the quality of research that makes any finding valuable, not the finding itself. It might easily happen to you that the results will not be in line with the mainstream intuition or that a simpler method will lead to more reasonable results than a more advanced model, but that’s okay.

**Exam: Presentation of the final paper during the workshop at the end of May.**

**Grades:** Intermediate stages and presentations - 20 points each (60 in total), final paper + presentation, and participation at the workshop 40 points. **The final paper and participation at the workshop are necessary conditions to pass the course, even if the sum of intermediate points exceeds 50.5 (which likely will).**