Master in Applied Economics Electives

Students need to take 7 elective courses to complete their studies. Each course is 12 weeks long plus a final exam week.

Applied Time Series

Kamil Kovar, Economist, Moody's Analytics, and Peter Stefko, Trader & Data Analyst, RSJ

In this course, the students will be challenged with the quantitative problems arising in finance. Over the course the students will address a variety of problems from finance such as building financial models, estimation and inferences of financial models, volatility estimation, risk management, testing financial economics theory, capital asset pricing, etc. The course also provides introduction into the field of economic and especially econometric forecasting based on time series. Students should also be able to evaluate the relative usefulness and reliability of various types of forecasts used in the consulting business and they should be able to design and estimate simple forecasting models.

Student evaluation:

- *"The course was great, it was interesting with different topics, from finance and macro. Both teachers were always prepared and they are excellent."*
- *"Overall the course is very attractive. We learned a lot."*
- *"Kamil was highly organized and very demanding. He wants to push students as much as possible which is very beneficial for the intellectual stimulation.*

Corporate Finance and Valuation

Richard Podpiera, Ph.D., Executive Director – Retail Group Segment Management, CSOB Bank

The goal of this course is to teach students key concepts and their practical applications in corporate finance and valuation so that they are well prepared for starting their careers in corporate finance, investment banking, commercial banking, or management consulting. The aim is to show students how managers solve practical problems using key corporate finance concepts and therefore business cases and real world applications will be used extensively throughout the course.

Student evaluation:

- *"Richard was one of the best teachers in the whole program. Very experienced, very well prepared, and with very good approach to students. Open to questions, answering very deeply and in a very knowledgeable way. I learned a lot with this teacher. Very well organized, everything was clear."*
- *"Definitely the best course in my eyes. I have learned most important stuff from the corporate finance, valuation and M&A world."*

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Development and Behavioral Economics

Doc. Michal Bauer, Ph.D., CERGE-EI

The aim of this course is to describe and discuss how rigorous empirical evidence, in particular experimental economic approaches, can shed light on fundamental issues – both about important issues in economic development, as well as about individual decision-making (i.e., assumptions we make in micro-economic analysis). Consequently, the course has two parts.

The first part focuses on selected topics in development economics, a field of economics which studies pressing questions about sources of poverty. We will focus on debates about schooling, health, borrowing, saving, fertility decision-making, and psychology of poverty.

The second part will present some of the key concepts in behavioral economics, a modern and quickly emerging field that aims to enrich microeconomic analysis with psychological in-sights. We will focus on the following topics: (i) limited self-control, (ii) social preferences and fairness, (iii) decision-making in groups/teams, and (iv) inattention and other behavioral sources of discrimination.

Student evaluation:

- *"I didn't know what to expect but I was positively surprised. Really interesting field of economics. Great course."*
- *"Michal is amazing teacher. You can see that he is really an expert for the field. Lectures were well structured, interesting, a lot of discussion."*

Forecasting and Stress Testing Risk

Moody's Analytics team (Brenda Solis Gonzalez, Assistant Director, and Vera Tolstova, Economist)

This course is intended for future risk management practitioners at all levels: from analysts and risk modelers to heads of departments in financial institutions and financial regulatory authorities. The course takes a hands-on approach to learning key aspects of forecasting and stress testing. As financial institutions are required to comply with increasingly stringent and complex requirements, these stress-testing exercises are designed to anticipate a broad spectrum of shocks to prepare for changing macroeconomic and market conditions. The technical aspects of forecasting and stress testing, as well as their implication for business planning and regulatory requirements, are covered.

We will study some of the key models used for risk management including methodologies for macroeconomic scenario generation, and design of models for market, credit, interest rate and liquidity risk. We will employ econometric techniques, numerical methods and statistical software used in the financial industry. Context for each topic is provided by real case studies from project management experience with many of the most important financial institutions worldwide.

Student evaluation:

- *"I have learnt a lot and the course gave me an understanding and practical application of what a day to day risk modeler does."*
- *"Great and truly applied class taught by professionals!"*
- *"What I liked about Brenda the most is that she is clearly a business person and professional. She did not focus on theoretical approach and showed us how forecasting and stress testing work in real life."*

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Human Resource Economics

Eva Hromadkova, Ph.D., MAE Program Director, Senior Analyst of the Economy, Czech National Bank

The main objective of this course is to develop the skills needed to understand analyses based on time series data and to learn how to apply these skills when solving specific empirical issues that a data scientist may encounter in this field. We will discover non-parametric and parametric models for univariate and multivariate stochastic processes, we will describe their specific advantages and pitfalls, and we will explore how these models are used for forecasting. In the course, we will cover both the theory and the practical application using statistical software, focusing mainly on practical applications of time series methods in academic and institutional research and business analyses. The prerequisites of the course are introductory statistics and econometrics and the knowledge of economic theory.

Student evaluation:

- *"One of the two best courses during the summer semester! Even though the material was not that easy, the teacher was able to present it in understandable and engaging way. I would recommend this course to other students definitely."*
- *"Eva is clear in presentation. And I like the overview and bigger pictures she tries to make."*

Machine Learning Techniques

Michal Kubista, Senior Technological Officer, Nielsen A.G.

The course introduces the newly emerging and very prospective field of machine learning. With the development of information and communication technologies, particularly, customer relationship management (CRM) computer systems, the proliferation of smart phone technologies and the mass use of social networks all around the globe, the regular and efficient collection of data is not an issue anymore. The challenge today is rather how to handle the abundance of collected available for making a more precise informed decisions in any business area.

The purpose of the course is to build advanced data-science and econometrics skills required for precise and unbiased identification of the relationships between the market data inputs and resulting observed behavior.

The knowledge and abilities that students would acquire in the course would open them the doorway for successful career in strategic consulting, data analysis and business development. They will get acquainted with different models that could be used for pricing and advertising analysis, recommendation systems and demand planning. Statistical software packages for the practical part of the course are especially selected to correspond to the toolbox commonly applied by the big marketing agencies and managerial consultancies but also by the analytical departments of leading multinational corporations.

Please, note that at least basic knowledge of R is a precondition for taking this course.

Student evaluation:

- *"The most applicable and fascinating class! Lectures and other materials were organised well. Course outline is great. My programming skills have improved significantly as well as my knowledge of marketing."*
- *"One of the best courses so far. Extremely practical, clear explanation on real use cases. I benefited from the teacher who had real experience from private company.*

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Introduction to Time Series Analysis

Ing. Mgr. Pavla Vozarova, Ph.D., Czech Technical University (CVUT)

The main objective of this course is to develop the skills needed to understand analysis based on time series data and to learn how to apply these skills when solving specific empirical issues that a data scientist may encounter in his field. We will discover non-parametric and parametric models for univariate and multivariate stochastic processes, we will describe their specific advantages and pitfalls, and we will explore how these models are used for forecasting. In this course, we will cover both the theory and the practical application using statistical software, focusing mainly on practical applications of time series methods in academic and institutional research and business analysis. The prerequisites of the course are introductory statistics and econometrics and the knowledge of economic theory.

Student evaluation:

- *"Pavla is great teacher and person. I really enjoyed her classes. Well structured, well prepared, really knowledgeable about topic, lot of discussion. Nice atmosphere."*
- *"Pavla is very organized and clear. She tries to explain everything in a logic and simple way. She promotes discussion and student participation. For me, she was the best teacher this semester!"*

Monetary Theory and Policy

Branislav Saxa, Ph.D., Principal Economist, Head of Monetary Analyses and Monetary Policy Transmission Team, Czech National Bank

The main aim of this course is to achieve understanding of the goals of monetary policy and instruments available to central banks in order to pursue these goals. After establishing a series of stylized facts, lectures on interest rates and inflation lead to the study of monetary policy transmission mechanism. Consequently, the idea and key ingredients of New Keynesian model are studied. Money creation in modern economy is explained. While the focus of the course is on the inflation targeting, the alternative monetary policy regimes and the choice among them are discussed too. Towards the end of the course, unconventional monetary policies are covered with the overview of their recent use. Throughout the course, a special attention is paid to monetary policy in open economies and economies in various stage of transition.

Student evaluation:

- *"One of the best courses at CERGE-EI. Practical theory, that helps understand basic behavior from the economy from the monetary perspective, which everyone can use in his or her normal life. The class was well structured, providing numerous example from real life. The course extremely benefited from Brano's working experience and know-how which I would like to emphasize. I was not missing anything in this course."*
- *"I have learnt a lot and I really liked this course. We had interesting discussions and lectures were not boring at all! Well-organized lectures and the teacher belongs to my top 3 teachers that I have had in CERGE-EI."*

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Policy Evaluation

Miroslava Federicova, Ph.D. and Filip Pertold, Ph.D. Institute for Democracy and Economic Analysis (IDEA) of the Economic Institute of the Czech Academy of Sciences

The aim of this course is to offer students systematic and rigorous tools in order to evaluate the impacts of a wide spectra of public policies (in the field of labor, education, social issues and firm subsidies). Students will learn how to assess impacts of polices through controlled field experiments, ex-post evaluation methods that identify causal impacts of policies based on observational data, and incorporate impact assessments directly into policy making.

The course is divided into two parts. During the first lectures, students are provided with main identification and empirical strategies used nowadays in public policy evaluation.

The second part of the course is targeted on the real public policy issues in the Czech Republic and on the evaluation of these policies using the real administrative data. Under the supervision and help of the lecturer, students divided into small research teams will further evaluate the impact of already existing policies based on the data or suggest a new public policy and predict its impact.

Student evaluation: No evaluations available, newly offered course.

Public Finance

Mgr. Radka Stikova, Ph.D., Principal Economist, Head of Fiscal Analysis Team, Czech National Bank

The course covers standard topics related to fiscal policy. The starting point is an introduction to the government's role in the economy. Then theory of taxation, government expenditure policies and selected methodological issues are discussed in more details. The second part of the course focuses on selected challenges of the current fiscal policy, such as impacts of population ageing, debt sustainability, pro-cyclicality of fiscal policy, etc. Lastly, it touches on several topics relevant for policymakers, e.g. fiscal forecasting, public debt management, setting of fiscal rules, role of fiscal conflicts, etc.

Student evaluation:

- *"Very interesting course. The topics were suitable and useful."*
- *"I definitely learned a lot. I am personally interested in the topic so it was nice we had a teacher who is actually doing public finance in her job. So, we went through theoretical part but also through practical."*
- *"Radka is a great teacher, well organized, efficient. Interesting discussions, a lot of practical examples. Final project was also cool."*

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Strategic Thinking: Theory and Practice

Ole Jann, Ph.D., CERGE-EI

The main objective of this course is to develop the skills needed to understand analyses based on time series data and to learn how to apply these skills when solving specific empirical issues that a data scientist may encounter in this field. We will discover non-parametric and parametric models for univariate and multivariate stochastic processes, we will describe their specific advantages and pitfalls, and we will explore how these models are used for forecasting. In the course, we will cover both the theory and the practical application using statistical software, focusing mainly on practical applications of time series methods in academic and institutional research and business analyses. The prerequisites of the course are introductory statistics and econometrics and the knowledge of economic theory.

Student evaluation:

- *"Amazing course. Extremely well-structured with real life examples and problems."*
- *"Ole is a true professional with a lot of experience from all over the world which he wants to pass on to his students. He was brilliantly prepared for every lecture. He has the ability to explain complicated problems in a simple manner. One of the best professors I had at CERGE-EI."*

Topics in Advanced Data Analysis

Prof. RNDr. Jan Hanousek, CSc., DSc., CERGE-EI

In this course, we aim to cover a wide range of topics associated with the collection and use of macro-economic variables, use of statistical portal data, preparation and analysis of surveys, and running randomized experimental methods (matching). Besides the estimation method, and links between theory and existing applications we should also tackle various database use, and possible linkages between data sources, including the use of different frequencies in trading data, constructing macro and sectoral data from surveys, firm-level data, etc.

The aim is to provide students with advance knowledge of the elements of statistical inference, namely multivariate statistics and multivariate data analysis methods. Students will understand and be able to perform standard and advanced descriptive and inferential data analysis, investigate and test relationship between variables as well as specify, use and interpret multivariate models, including generalized regression-type models.

Student evaluation:

- *"This course helped me to understand better what it is like to work as a data analyst and how to present findings. Studying under prof. Hanousek helped me grow intellectually."*
- *"Honza is a special teacher. He is a true expert in his area and always provides valuable feedback."*

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Topics in Macroeconomics

Jose Luis Luna Alpizar, Ph.D., CERGE-EI

In this course, we will review and analyze modern theories of labor markets used in macroeconomics. This course will provide an introduction to job search models and their microeconometric applications with a specific focus on their use in policy analysis and macroeconomic modeling. Special emphasis will be placed on methods to make use of accessible panel data and repeated cross sectional data to describe and explain real-life phenomena such as unemployment volatility, wage dispersion, and the impact of labor policies such as unemployment insurance. The objective of this course is to provide students with a set of concepts and tools that they can use for quantitative policy analysis on several fields of study: labor, I/O, macro, applied micro, development, and family economics. Although the course has a sound theoretical (mathematical derivations) component, we will focus on applied exercises (MATLAB, Python, R) with real data.

Student evaluation:

- *"That class is just great! Even it turned to be slightly over complicated in the second half of semester (technically this is the most complicated class we had), I enjoyed it a lot."*
- *"I liked this class a lot, I would definitely take it again."*

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