Name of Course	**DXE_EMT2 Econometrics 2**
Lecturer	Ing. Daniel Němec. Ph.D.
ECTS	12 credits
Extent and Intensity	24 teaching hours, 45 minutes each (6 lectures á 4 hours)
Schedule	Will be precised
Course objectives	On the basis of the introduction to econometrics as covered in the course Econometrics, advanced econometric topics will be the subject of this course. Besides conceptual topics such as maximum likelihood estimation, econometric methods for empirical analysis of time series data will be the main content; in addition, models for analyzing limited dependent variables and for analyzing panel data will be covered. The course is designed to provide students with a good knowledge of basic and advanced econometric tools so that: - they will be able to apply these tools to modeling, estimation, inference, and forecasting in the context of economic problems; - they have experience in applying the econometric software Gretl for analyzing data; - they can evaluate critically the results from others who use econometric methods and tools; - they have a basis for further studies of econometric literature.
Prerequisites	Participants should be familiar with the following topics: Linear algebra – linear equations, matrices, vectors (basic operations and properties). Descriptive statistics – measures of central tendency, measures of dispersion, measures of association, histogram, frequency tables, scatterplot, quantiles. Theory of probability – probability and its properties, random variables and distribution functions in one and several dimensions, moments, convergence of random variables, limit theorems, law of large numbers. Mathematical statistics – point estimation, confidence intervals for parameters of normal distribution, hypothesis testing, p-value, significance level. Basic econometrics - ordinary least squares method, linear regression, classical assumptions and their violations. These topics correspond to the chapters the appendices of Verbeek's book, in particular, to the chapters 1-5 and sections: A1, A2, A3, A4, A6, A8, B1, B2, B3 (excluding Jensen's inequality), B4, B5, B6 and B7 (excluding some properties of the chi-squared distribution and the F-distribution).

Syllabus	1. Maximum likelihood Estimation and Specification Tests (Verbeek, Ch.6)
	   - The concept of maximum likelihood;
	   - Specification tests;
	   - Tests in the normal linear regression model;
	   - Quasi-maximum likelihood and moment conditions tests.
	2. Models with Limited Dependent Variables (Verbeek, Ch.7)
	   - Binary choice models;
	   - Multiresponse models;
	   - Tobit models.
	 3. Univariate time series models (Verbeek, Ch.8)
	   - ARMA processes;
	   - Stationarity and unit roots;
	   - Testing for unit roots;
	   - Estimation of ARMA models;
	   - Choosing a model. 4. Multivariate time series models, part 1 (Verbeek, Ch.9)
	   - Predicting with ARMA models;
	   - Autoregressive conditional heteroskedasticity;
	   - Dynamic models with stationary variables;
	   - Models with nonstationary variables.
	5. Multivariate time series models, part 2 (Verbeek, Ch.9)
	   - Vector autoregressive models;
	   - Cointegration: the multivariate case;
	6. Models Based on Panel Data (Verbeek, Ch.10)
	   - Static and dynamic linear models;
	   - Nonstationarity, unit roots, and cointegration;
	   - Models with limited dependent variables.

Literature	VERBEEK, Marno. *A guide to modern econometrics*. 3rd ed. Chichester: John Wiley & Sons, 2008. xv, 472. ISBN 9780470517697.
Teaching methods	Class discussion, homework including computer exercises using Gretl, and presentation of homework by participants; course language is English.
Assessment methods	For grading, written homework, presentation of homework in class, and a final written exam will be taken into account. The weight for homework will be 40 %, that of the written final exam 60 %. Presentation of homework in class means that students must be prepared to be called at random to the blackboard.
Additional notes	The minimum of students for opening the course is 5.

Name of Course	**DXF_OCAK Asset Pricing**
Lecturer	doc. Ing. Tomáš Výrost, PhD.
ECTS	12 credits
Extent and Intensity	24 teaching hours, 45 minutes each (6 lectures á 4 hours)
Schedule	Fri 6. 3. 08:00--12:00 P302b, Fri 13. 3. 08:00--12:00 S307, Fri 27. 3. 08:00--12:00 S307, Fri 3. 4. 08:00--12:00 S307, Fri 17. 4. 08:00--12:00 S307
Course objectives	The course is only offered to the students of the study fields the course is directly associated with.
Prerequisites	The use of own personal laptops with a spreadsheet program is strongly encouraged. The use of econometric software is strongly encouraged (for example, GRETL may be freely downloaded from http://gretl.sourceforge.net/, available for Windows/Linux/Mac). The course participants are expected to be familiar with the following topics: – Univariate and multivariate functions. – Unconstrained optimization, constrained optimization using Lagrange multipliers. – Matrix algebra – addition, multiplication, transpose, inversion. – Basic statistics – expected value, variance, covariance. – Basic econometrics – model specification, estimation via OLS, model assumptions.
Syllabus	Basic concepts in finance and statistics (discounted present value, utility, asset demand, significance tests, linear models, single/multivariate models). - Efficient market hypothesis, predictability of stock returns (definition of EMH, empirical tests of EMH, econometric models for stock return predictability). - CAPM and factor models, performance measures (Capital asset pricing model, systematic risk, performance measures, extensions, Fama-French three-factor model, empirical application and testing). - Stochastic discount factor models, consumption-CAPM (return predictability under C-CAPM, equity premium puzzle, extensions). - Term structure modelling (prices and yields, theories of the term structure, the expectation hypothesis, empirical evidence on the term structure).
Literature	CUTHBERTSON, Keith and Dirk NITZSCHE. *Quantitative financial economics : stocks, bonds and foreign exchange*. Second edition. Chichester: John Wiley & Sons, 2005. xiv, 720. ISBN 0470091711.
Teaching methods	Lectures, exercise sessions and home assignment.
Assessment methods	Graded home assignment (20%), written exam (80%). The home assignment must be handed in prior to taking the written exam. The participants are expected to be ready to present their home assignment during the last session upon request. Grades: 100 - 92 % = A, 91 - 84 % = B, 83 - 76 % = C, 75 - 68 % = D, 67 - 60 % = E, less than 60 % = F.