**SYLLABUS for Statistics and Econometrics**

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| **Basic data for the course** | | | |
| **Academic unit:** | Faculty of Economics | | |
| **Title of the course:** | **Statistics and Econometrics** | | |
| **Level:** | PhD | | |
| **Status of the course:** | Obliged | | |
| **Year of studies:** | First year, 1st semester | | |
| **Number of hours per week:** | 3 lectures | | |
| **ECTS credits:** | 10 ECTS | | |
| **Time/location:** | To be decided | | |
| **Tutor:** |  | | |
| **Tutor’s contact details:** |  | | |
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| **Content of the course** | Teaching central theorems and proofs of advanced statistical theory. The course content is coordinated with the course "Econometrics". Presentation of advanced methods of econometrics, In coordination with the "Statistics", the following are taught: application of existing methods to economic questions, critical evaluation of methods, and the combination and/or adaption of individual procedures to solve concrete problems. | | |
| **Course’s objectives:** | The lectures will not be in the classical form of teaching, but in the form of student centred. The role of the professor will be as moderator and participant in the class. The teaching process is organized through lectures by applying interactive discussion. The course consists of assignments and case studies of actual situations dealing with concepts covered in class and engaging in meaningful and critical class discussion with the peers. | | |
| **The expected outcomes:** | Having completed this module, students are acquainted with the most common advanced statistical methods and can read as well as critically reflect on scientific publications that employ these methods as well as econometric methods and can critically reflect on scientific publications that employ these methods. They can use these methods with sufficient confidence and can independently apply them to their own scientific questions. | | |
| **The students’ workload *(hours per semester, ECTS)*** | | | |
| **Activity** | **Weeks** | **Hours** | **Total** |
| Lectures | 15 | 3 | 45 |
| Seminars (theoretical and practical) | 2 | 16 | 32 |
| Case studies | 1 | 7 | 7 |
| Direct contact with tutor | 7 | 1 | 7 |
| Field research | 0 | 0 | 0 |
| Colloquiums(tests) | 2 | 3 | 6 |
| Homework | 3 | 8 | 24 |
| Individual study (at library or at home) | 15 | 6 | 90 |
| Final preparation for the exam | 2 | 12 | 24 |
| Evaluation | 0 | 0 | 0 |
| Projects, presentation etc. | 1 | 15 | 15 |
| **Total** |  |  | **250** |
| **Teaching methods:** | Grading: Problem sets will be assigned regularly. Students are strongly encouraged to discuss the assigned exercises with your fellow classmates. However, they should submit their own answers. The course grades will be determined by the grades on problem sets (30%), a midterm exam (30%) and a final exam (40%). Additionally, since the lectures will be offered with the co-teaching method (a professor from EU project partners and a local professor) there will be common agreement on evaluating criterias. | | |
| **Assessment methods:** | Concretization means / IT: Computer and projector  Ratio between the theoretical and practical part of teaching. The teaching process will consists of: 80% of the course is based on teaching theory, whereas 20% is organized in a practical way through researches, case studies, discussion and presentations | | |
| **Literature** | | | |
| **Basic literature:** | 1. Burtless, Gary. 1995. “The Case for Randomized Field Trials in Economic and Policy Research.” *Journal of Economic Perspectives*. Vol. 9 (2): 63-84. 2. David Kaplan. Bayesian Statistics for the Social Sciences (Methodology in the Social Sciences) 3. Heckman, James J., and Jeffrey A. Smith. 1995. “Assessing the Case for Social Experiments.” *Journal of Economic Perspectives*. Vol. 9 (2): 85-110. 4. Heckman, James J. 2000. “Causal Parameters and Policy Analysis in Economics: A Twentieth Century Retrospective.” *Quarterly Journal of Economics*. Vol. 115 (1): 45-97. 5. Keane, Michael P. 2010. "Structural vs. Atheoretic Approaches to Econometrics." *Journal of Econometrics,* 156 (1): 3-20. Tamer, Elie. 2010. “Partial 6. Angrist, Joshua D., and Alan B. Krueger. 2001. “Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments.” *Journal of Economic Perspectives*. Vol. 15 (4): 69-85. 7. Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. “How Much Should We Trust Differences-in-Differences Estimates?” *Quarterly Journal of Economics*. Vol. 119 (1): 249-275. 8. Angrist, Joshua D., and Alan B. Krueger. 1992. “The Effect of Age at School Entry on Educational Attainment: An Application of Instrument Variables with Moments from Two Samples.” *Journal of the American Statistical Association*. Vol. 87 (418): 328-336. 9. Arellano, Manuel, and Stephen Bond. 1991. “Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations.” *Review of Economic Studies*. Vol. 58 (2): 277-297. | | |
| **Additional literature:** | 1. Berry, Steven, James Levinsohn, and Ariel Pakes. 1995. "Automobile Prices in Market Equilibrium." *Econometrica*, 63(4): 841-90. 2. Berry, Steven and Ariel Pakes. 2007. "The Pure Characteristics Demand Model." *International Economic Review*, Vol. 48 (4): 1193-225. 3. Chay, Kenneth Y., and James L. Powell. 2001. “Semiparametric Censored Regression Models.” *Journal of Economic Perspectives.* Vol. 15 (4): 29-42. 4. Heckman, James J. 2010. "Building Bridges between Structural and Program Evaluation Approaches to Evaluating Policy." *Journal of Economic Literature*, 48(2): 356-398. | | |

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| **The detailed plan of work:** | |
| **Week** | **Topic** |
| **Wee 1** | Foundations of Bayesian Statistics, Probability Concepts and Axioms |
| **Wee 2** | Statistical Elements of Bayes' Theorem, The Assumption of Exchangeability |
| **Wee 3** | Common Probability Distributions, Markov Chain Monte Carlo Sampling |
| **Wee 4** | Topics in Bayesian Modeling, Bayesian Hypothesis Testing |
| **Wee 5** | Bayesian Linear and Generalized Linear and Regresion Models, Missing Data from a Bayesian Perspective |
| **Wee 6** | Bayesian Multilevel Modeling; Bayesian Modeling for Continuous and Categorical Latent Variables |
| **Wee 7** | First test |
| **Wee 8** | Causal Parameters and Policy Analysis in Economics: A Twentieth Century Retrospective |
| **Wee 9** | Structural vs. Atheoretic Approaches to Econometrics |
| **Wee 10** | Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments |
| **Wee 11** | Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations |
| **Wee 12** | Automobile Prices in Market Equilibrium |
| **Wee 13** | Pure Characteristics Demand Model |
| **Wee 14** | Semiparametric Censored Regression Models |
| **Wee 15** | Second test |

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| **Academic policies and code of conduct:** |
| Cheating on examination; Plagiarism; Misrepresentation or falsification of data of an examination; Unauthorized communication during examinations; Knowingly allowing another student to represent your work as his or her own; Forgery, alteration, or knowing misuse of graded examinations, quizzes, grade lists, or official records of documents; Theft or destruction of examinations or papers; Submitting the same work in more than one course; Altering or destroying another student’s work or records, Attempting improperly to influence the award of any credit, grade, or honor; Violation of the rules governing teamwork; Failure to comply with the sanctions imposed under the authority of this code. |