**Course Syllabus**

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| Title of the course | | **Computational Economics** | | | | |
| Title of the Academic Programme | | Bachelor in Economics (3rd year) | | | | |
| Course Overview | | This course teaches the basics of programming and computational skills for economic analysis. Significant part of the course is centered around  dynamic models from micro- and macroeconomics. Basic data manipulation methods are also covered, together with the data visualization techniques which are used extensively for visual analysis and presentation of numerical solutions. | | | | |
| Learning Objectives | | The course is taught in Python, and provides basic training in core language features and common scientific libraries. | | | | |
| Extended Learning Objectives | | Reinforcement of key ideas from a number of static and dynamic economic models, including their generalizations that do not admit analytic solutions  Ability to implement familiar mathematical methods and algorithms in computer code.  Basic coding skills for scientific computations in economics | | | | |
| Content and Structure of the Course | | | | | | |
| **№** | **Topic / Course Chapter** | | **Total** | **Directed Study** | | **Self-directed Study** |
| **Lectures** | **Tutorials** |
| 1. | Introduction to Computational Economics | | 8 | 2 | 2 | 4 |
| 2. | Analysis of dynamics: Finite Markov chains | | 8 | 2 | 2 | 4 |
| 3. | Multiple agent approach: Segregation Model | | 8 | 2 | 2 | 4 |
| 4. | Dynamic programming: optimal saving and growth model | | 8 | 2 | 2 | 4 |
| 5. | Credit Cycle model | | 8 | 2 | 2 | 4 |
| 6. | Forecasting methods: Structural vector-autoregressive model | | 8 | 2 | 2 | 4 |
| 7. | Theory-based analysis of empirical estimates: Spatial equilibrium model | | 8 | 2 | 2 | 4 |
| **Total study hours** | | | 56 | 14 | 14 | 28 |
| Indicative Assessment Methods and Strategy | | Student’s progress is measured by class participation, homework, and project (weights are 0.2, 0.3, and 0.5, respectively). | | | | |
| Readings / Indicative Learning Resources | | Lectures and seminars  <https://github.com/askorobogat/CompEcon>  Bibliography  Verbeek M. A Guide to Modern Econometrics. Chichester: John Wiley & Sons, 2000, ch. 9, 10.  Glaeser, Edward L., 2008. Cities, agglomeration, and spatial equilibrium. Oxford University Press, Oxford and New York.  Skorobogatov A. Why do newer cities promise higher wages in Russia? // Journal of Urban Economics, 2018, Vol. 104, pp. 16-34.  Young H. P. Individual Strategy and Social Structure. Evolutionary Theory of Institutions. Princeton: Princeton University Press, 1998, ch. 1, 3.  Barro R., Sala-i-Martin X. Economic Growth. MIT Press. Ch. 2.  Wang, Y., Wu, C., & Yang, L. (2013). Oil price shocks and stock market activities: Evidence from oil-importing and oil-exporting countries. Journal of Comparative Economics, 41(4), 1220-1239.  Kilian, L., Park, C. The impact of oil price shocks on the US stock market. International Economic Review, 2009. 50(4), 1267-1287.  Kiyotaki N., Moore J. Credit cycles. Journal of Political Economy. 1997. No 2. P. 211-248.  Ryo Kato, 2003. "[Matlab code for Kiyotaki-Moore credit cycles](https://ideas.repec.org/c/dge/qmrbcd/113.html)," QM&RBC Codes 113, Quantitative Macroeconomics & Real Business Cycles.  Additional materials  <https://github.com/fediskhakov/CompEcon>  <https://python.quantecon.org/intro.html> | | | | |
| Course Instructor | | Alexander S. Skorobogatov | | | | |