**Course Syllabus**

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| Title of the course | **Theory Construction and Model Building (offered in English)** |
| Title of the Academic Programme  | BA “Sociology and Social Informatics” |
| Type of the course | Elective |
| Prerequisites | Sociological Theory, Information Systems |
| ECTS | 6 |
| Total indicative study hours | Directed Study | Self-directed study  | Total |
| 70 | 158 | 228 |
| Course Overview | The course aimed at equipping students with tools to transform ideas into formal theories.Based on concepts from Sociological Theory and specifically of Analytical Sociology, students will get experience in working with theoretical constructs and relationships in order to generate, adapt and build on theoretical models. The main focus is on causal analysis and contemporary approach to explanation in social science. The course includes large practical part which covers working with path models, agent-based models, and other modern tools of Computational Social Science.The course is targeted to students considering research or analytical career. |
| Intended Learning Outcomes (ILO) | * Thoroughly understand the role of theory in sociological research
* Understand the link between theorizing and modeling
* Interpret modeling results in sociological terms
* Generate research ideas
* Translate research ideas into formal theories
* Design research based on contemporary approaches to model building, including path modelling and simulation
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| Teaching and Learning Methods | Teaching and learning methods include a lecture, seminars, group work, practical home assignments (Netlogo, Path modelling, R).  |
| Content and Structure of the Course |
| **№** | **Topic / Course Chapter** | **Total** | **Directed Study** | **Self-directed Study** |
| **Lectures** | **Tutorials** |
| 1 | Understanding and explanation in social sciences | 25 | 2 | 8 | 15 |
| 2 | Concepts. Instantiation  | 28 |  | 8 | 20 |
| 3 | Relationships and thought experiments | 28 |  | 8 | 20 |
| 4 | Causality. Causal models | 28 |  | 8 | 20 |
| 5 | Mathematical modeling | 28 |  | 8 | 20 |
| 6 | Tools for Mechanism-Based Explanation in Social Sciences | 23 |  | 8 | 15 |
| 7 | Building Agent-Based Models | 38 |  | 10 | 28 |
| 8 | Analyzing Agent-Based Models | 30 |  | 10 | 20 |
| **Total study hours** | 228 | 2 | 68 | 158 |
| Indicative Assessment Methods and Strategy  | * Seminar Participation (20% of the cumulative grade)
* Essay paper I (theoretical) (20% of the cumulative grade)
* Essay paper II (path modelling) (20% of the cumulative grade)
* Homework Agent-Based modelling (20% of the cumulative grade)
* Essay paper III (simulation) (20% of the cumulative grade)

Each of the missed seminars is compensated by 500 words make up essay on the topic of the seminar.Final grade equals to cumulative grade. |
| Indicative Self- Study Strategies | **Type** | **+/–** | **Hours** |
| Reading for seminars / tutorials (lecture materials, mandatory and optional resources) | + | 40 |
| Assignments for seminars / tutorials / labs | + | 60 |
| E-learning / distance learning (MOOC / LMS) | **–** |  |
| Fieldwork | **–** |  |
| Project work | **+** | 58 |
| Other (please specify) | **–** |  |
| Preparation for the exam | **–** |  |
| Readings / Indicative Learning Resources | Mandatory * Cioffi-Revilla, Claudio. 2014. *Introduction to Computational Social Science: Principles and Applications*. 2014 edition. London ; New York: Springer.
* Elster, Jon. 2015. *Explaining Social Behavior: More Nuts and Bolts for the Social Sciences*. 2 edition. Cambridge, United Kingdom: Cambridge University Press.
* Jaccard, James, and Jacob Jacoby. 2009. *Theory Construction and Model-Building Skills: A Practical Guide for Social Scientists*. 1 edition. New York: The Guilford Press.

Optional * Hedström, Peter, and Peter Bearman, eds. 2011. *The Oxford Handbook of Analytical Sociology*. 1 edition. Oxford: Oxford University Press.
* Wilensky, Uri, and William Rand. 2015. *An Introduction to Agent-Based Modeling: Modeling Natural, Social, and Engineered Complex Systems with NetLogo*. MIT Press.
* Downey, Allen B. 2012. *Think Complexity: Complexity Science and Computational Modeling*. 1 edition. O’Reilly Media.
* Easley, David, and Jon Kleinberg. 2010. *Networks, Crowds, and Markets: Reasoning About a Highly Connected World*. 1 edition. New York: Cambridge University Press.
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| Academic Support for the Course | Academic support for the course is provided via e-mail and dropbox |
| Facilities, Equipment and Software | A computer class with NetLogo, R and required packages installed |
| Course Instructor | Professor Daniel Alexandrov, Sr. Lecturer Ksenia Tenisheva, Sr. Lecturer Ilya Musabirov, Research Intern Viktor Karepin |