**Data mining on networks**

**Lecturers:**

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# 1. Course Objective

Networks are ubiquitous in science and engineering of our days. Many fundamental and applied problems related with complex systems can be investigated via network approach. Data mining on networks is an attractive area of modern research in computer science. The course will give a comprehensive introduction in this topics. We will explain a popular “small word” model with application to the WWW network, discuss methods and algorithms of communities detection in networks and study applied network model of stock market. Theoretical study will be followed by a practical work with real data.

# 2. The position of the course in the structure of the educational program

Course duration: 1 week, 16 hours (tutorials + workshops)

Academic control forms are home assignments and written test.

## 2.1. Prerequisites of the course: it is important but not necessary to have knowledge in

* Basics of Graph Theory
* Basics in Linear Algebra
* Basics in Probability

# 3.Topic-Wise Curricula Plan

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| --- | --- | --- | --- | --- |
| № | Topic name | Course hours, total | Audience hours | |
| Lectures | Practical studies |
|  | Introduction in networks |  | 2 |  |
|  | “Small word” model and random graphs |  | 2 | 2 |
|  | Communities detection in networks |  | 4 | 2 |
|  | Network models of stock market |  | 2 | 2 |
|  | **Total** | 16 | 10 | 6 |

**4. Readings:**

1. Newman M.E.G. [Networks: an introduction](http://scholar.google.ru/citations?view_op=view_citation&hl=ru&user=rQ68pVwAAAAJ&citation_for_view=rQ68pVwAAAAJ:0EnyYjriUFMC), Oxford University Press, 2010.
2. Lewis T.G. Network Science: Theory and Applications, Wiley , 2009
3. Kalyagin V.A. Pardalos P.M. Themistocles R.M. (Editors) Network Models in Economics and Finance, Springer Optimization and its Applications, v.100, 2014.