Title and <mark>Code</mark> of Course: **Introduction to Social Network Analysis: Theoretical Basics and Applications** **ERPB-BSZOC 9116**			

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Credit Point Value:	Number of Lessons per Week: **2**	Type of Course: **Seminar** ☒ **Lecture** ☐	Method of Evaluation: **Oral Examination** ☐ **In-Class Presentation** ☐ **Other** ☒

Course Description:

Networks have always been omnipresent in societies. But their importance and visibility have tremendously increased with the dawn of the Internet and online social media. Understanding the emergence and functioning of social networks is a major challenge for the social sciences, as well as for the policy-makers.

Studying social networks usually involves a variety of social science disciplines including sociology, economics, political science, psychology and anthropology. Network science has solid mathematical foundations upon which large-scale empirical research can be built. But fortunately, its very mathematical basics are also accessible for social science students. Acquiring these basics enables to understand a broad range of the network phenomena that influencing our daily lives.

The course provides an introduction to network studies. Doing so, it is also paving the way for more advanced sequel courses in the field. It gives a solid understanding on the network basics, in parallel with demonstrating their use in real-world examples and applications. The course gives some illustrations of the use, and usefulness, of more advanced analytical methods with which the behavior of very large networks can be better traced and influenced. How do different effects – like contagious diseases, hypes, gossips, opinions – spread on networks? How do we close ourselves into 'information bubbles', and with which methods can fresh information penetrate these bubbles? Occupying which network positions give extra power for the incumbents and which network nodes are peripheral in importance?

The seminars fall into two types. In one, crucial theoretical basics are communicated, followed by the joint discussion of pertaining examples and applications. During the other seminar type, students present influential network papers assigned to them by the tutor at the first class. The presentations are followed be the tutor's update, with related theoretical findings and applications, which the participants jointly discuss.

The topics of the course include:

1. The constituents of a network. Basic network concepts.
2. Local and global properties of networks.
3. How do large networks evolve? The success of popular Internet pages. Getting links with preferential attachment.
4. How do large networks disband? The case of the iWIW online social media network.
5. Network stability. The 'strength of weak ties'.
6. How do impacts travel on networks? Social diffusion processes: epidemics, fake news, gossips.
7. Political networks, political influencing. Social bubble formation, crowd founding.
8. Positive and negative network ties. The role of the negative ties in network evolution.
9. Powerful positions in networks. Structural holes.
10. Clandestine networks. Detecting illicit activities in networks.
11. The network aspects of virtual currencies (Bitcoin, Ethereum, etc.)
12. Privacy in the Internet age. Coding and personal data protection issues.

Bibliography

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- Mark S. Granovetter (1973) The Strength of Weak Ties. *American Journal of Sociology,* 78(6): 1360-1380.
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- Milgram, Stanley (1967). The Small World Problem. *Psychology Today,* 1(1): 61-67.
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- Kmetty Zoltán, Koltai Júlia, Tardos Róbert (2017) „Core Ties Homophily and Sociocultural Divides in Hungary from 1987 to 2015." INTERNATIONAL JOURNAL OF SOCIOLOGY 47 : 228-249.

- Károly Takács, Andreas Flache, Michael Mäs (2016) „Discrepancy and Disliking Do Not Induce Negative Opinion Shifts." PLoS ONE 11(6): e0157948.

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Kisfalusi Dorottya, Takács Károly, Pál Judit (2019) „Gossip and Reputation in Adolescent Networks." In: Francesca, Giardini; Rafael, Wittek (szerk.) The Oxford Handbook of Gossip and Reputation. pp. 359-379. Oxford, UK : Oxford University Press.

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