Course title: Discrete Mathematics 1	Neptun code: GEMAN401-a

Course coordinator: Dr. Jenő Szigeti, DSc, professor

type of lesson and number of lessons: **lecture (2)**

method of evaluation: colloquium

curriculum location of the subject: (autumn/spring semester): autumn and spring

pre-study conditions *(if any)*: -

The task and purpose of the subject:

The objective of the course is to introduce PhD students to discrete mathematical concepts related to the foundation of informatics research. The aim of the course is to develop the ability to identify and solve problems within this field.

Course description:

Graph theory and its applications. Fundamental concepts of graph theory. Matchings, planar graphs, colouring. Flows. Euler and Hamiltonian theorems. Ramsey-type theorems. Random graphs.

Required literature:

1. Reinhard Diestel: Graph Theory GTM 173, Sixth edition 2024 Springer-Verlag, Heidelberg Graduate Texts in Mathematics, Volume 173 ISBN 978-3-662-53621-6   eISBN 978-3-96134-005-7 2024

2. Lovász László: Combinatorial Problems and Exercises, American Mathematical Society, 2007. ISBN 0821842625

3. R. J. Wilson: Introduction to Graph Theory, Addison Wesley, 1996.

Recommended literature:

1. J. A. Bondy , U. S. R. Murty: Graph Theory, Springer-Verlag London 2008, https://doi.org/10.1007/978-1-84628-970-5

2. T. Harju: Lecture Notes on Graph Theory, University of Turku, 2007. http://users.utu.fi/harju/graphtheory/graphtheory.pdf