MATH-260

Discrete mathematics

Pach János

Cursus	Sem.	Type
Mathematics	BA3	Obl.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	**4 weekly**
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Study of structures and concepts that do not require the notion of continuity. Graph theory, or study of general countable sets are some of the areas that are covered by discrete mathematics. Emphasis will be laid on structures that the students will see again in their later studies.

Content

1. Elementary Combinatorics, counting.
2. Graphs, Trees.
3. Partially ordered sets, Set systems.
4. Generating functions.
5. Probabilistic method.
6. Linear Algebra method.

Keywords

Combinatorics, graphs, set systems

Learning Prerequisites

Required courses

Linear algebra, Analysis

Learning Outcomes

By the end of the course, the student must be able to:

- Analyze the structures
- Implement the systems
- Demonstrate the concepts for the discrete mathematics

Transversal skills

- Use a work methodology appropriate to the task.

Teaching methods

Ex cathedra lecture with exercises in the classroom.

Assessment methods

Written exam.

Resources

Bibliography

Discrete Mathematics: Elementary and Beyond (L. Lovasz, J. Pelikan, K. Vesztergombi), Combinatorics: Set Systems etc. (B. Bollobas), Invitation to Discrete Mathematics (J. Matousek, J. Nesetril).

Ressources en bibliothèque

- Combinatorics : set systems, hypergraphs, families of vectors and combinatorial probability / Bollobás
- Discrete Mathematics: Elementary and Beyond / Lovasz
- Invitation aux mathématiques discrètes / Matousek
- Invitation to Discrete Mathematics / Matousek

Websites

- http://opac.nebis.ch/F/?local_base=nebis&con_lng=FRE&func=find-b&find_code=020&request=0-201-55802-5
- http://opac.nebis.ch/F?local_base=nebis&con_lng=FRE&func=find-b&find_code=020&request=978-0-07-331271-2