

MATH-260(b) **Discrete mathematics**

De Courcy-Ireland Matthew

Cursus	Sem.	Type
Mathematics	BA3	Obl.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	During the semester
Workload	150h
Weeks	14
Hours	4 weekly
Courses	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 Analyze discrete structures
- Formulate Formulate main theorems of the course
- Solve Solve typical combinatorial problems

Transversal skills

- Use a work methodology appropriate to the task.

Teaching methods

Ex cathedra lecture with exercises in the classroom.

Expected student activities

Solving homework problems

Assessment methods

Written exam.

Supervision

Office hours	Yes
Assistants	Yes

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. Nešetřil).

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