Exchange programme Vrije Universiteit Amsterdam

Vrije Universiteit Amsterdam - Exchange programme Vrije Universiteit Amsterdam - 2024-2025

Exchange

Vrije Universiteit Amsterdam offers many English-taught courses in a variety of subjects, ranging from arts & culture and social sciences, neurosciences and computer science, to economics and business administration.

The International Office is responsible for course approval and course registration for exchange students. For details about course registration, requirements, credits, semesters and so on, please visit the exchange programmes webpages.

Discrete Mathematics

Course Code	XB_0008
Credits	6
Period	P2
Course Level	100
Language Of Tuition	English
Faculty	Faculty of Science
Course Coordinator	dr. I. Canakci
Examiner	dr. I. Canakci
Teaching Staff	dr. I. Canakci
Teaching method(s)	Lecture, Written partial exam, Seminar

Course Objective

- The student knows basic concepts from graph theory and can solve problems about and with those in explicit situations.
- The student knows basic theorems and algorithms from graph theory and can use these to compute and/or prove certain properties in explicit situations.
- The student knows basic concepts from combinatorics and can solve problems about and with those in explicit situations.
- The student knows basic theorems and techniques from combinatorics and can use these to compute and/or prove certain properties in explicit situations.

Course Content

This course is about two (related) subjects, namely Graph Theory and Combinatorics.

A graph consists of points (or vertices) and lines (or edges) connecting pairs of points. Graphs occur as mathematical models for many situations in both pure and applied mathematics. Combinatorics involves formulas and techniques for enumeration.

We treat the following topics.

- Elementary graph concepts
- Trees, spanning trees
- Eulerian and Hamiltonian trails/circuits
- Planarity
- Matchings, flows
- Binomial coefficients and generalisations
- Pigeonhole and inclusion-exclusion principles
- Generating functions
- Recurrence relations
- Permutation groups

Additional Information Teaching Methods

Lectures, study sessions and tutorials (total 8 hours per week). Students are also required to hand in a homework assignment every week. We expect you to dedicate in total about 20 hours per week to this course.

Method of Assessment

Your final grade is built up as follows:

- a written midterm exam (50%);
- a written final exam (50%).

You will also be required to hand in 6 written assignments. Each of which will be graded as "sufficient" or "insufficient". A hand-in assignment that is initially graded as "insufficient", may be handed in a second time.

To pass the course in period 2 you must satisfy the following requirements:

- your final grade must be at least 5.5 (all students); and
- at least 5 out of your 6 hand-in assignments must have been graded as "sufficient" (all students).

If you do not fulfill these requirements, then you can take the resit exam. The resit exam then counts for 100% (i.e. any grades from the midterm and/or final exam in period 2 will no longer be valid) and the only requirement to pass is to score at least 5.5 on this exam.

Literature

John M. Harris, Jeffry L. Hirst and Michael J. Mossinghoff, Combinatorics and Graph Theory (second edition), Springer-Verlag, 2008, ISBN: 978-0-387-797710-6 (available form the library as e-book)

Additional Information Target Audience

First year BSc Mathematics

Recommended background knowledge

Necessary background: Basic Concepts in Mathematics