

# Combinatorial Optimization

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Course description

## Basic information

Field of study : Analytical Computer Science

Path : -

Organizational unit : Faculty of Mathematics and Computer Science

Education level : first-cycle

Form of study : full-time studies

Study profile : general academic

Mandatory status : elective

Education cycle : 2022/23

Course code : UJ.WMIIANS.1300.03364.22

Languages of instruction : Polish

Course related to scientific research : Yes

Disciplines : Computer Science, Mathematics

ISCED classification : 0588 Interdisciplinary programs and qualifications involving natural sciences, mathematics and statistics

USOS code : WMI.TCS.OK.S

Course coordinator

Bartłomiej Bosek

Course instructors

Bartłomiej Bosek

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Periods Semester 5, Semester 6		Form of verification of learning outcomes grade credit	Number of ECTS credits 3.0
		Form of instruction and hours seminar: 30	

## Learning outcomes for the course

Code	Outcomes in the field of	Field-specific learning outcomes	Verification methods
Knowledge – The student knows and understands:			
W1	knows formal methods of computer science, knows discrete and probabilistic methods modeling computer science issues	IAN_K1_W02	presentation
Skills – The student can:			
U1	can acquire and clearly present knowledge from professional literature	IAN_K1_U01, IAN_K1_U02, IAN_K1_U17, IAN_K1_U21, IAN_K1_U23, IAN_K1_U24, IAN_K1_U26	presentation
Social competences – The student is ready to:			
K1	knows the limitations of their own knowledge and understands the need for further education	IAN_K1_K01, IAN_K1_K02	presentation

## ECTS credits balance

Student activity form	Average number of hours* devoted to completed activity types	
seminar	30	
preparation of presentation	60	
Total student workload	Number of hours 90	ECTS credits 3.0

\* hour (lesson) means 45 minutes

## Program content

No.	Program content	Learning outcomes for the course
1.	This is a seminar whose subject matter concerns combinatorial optimization. In particular, we are interested in the following topics: 1) Matchings in graphs. 2) Packing objects on a plane. 3) Partial orders, dimension, width, partitions. 4) Coloring of graphs and partial orders.	W1, U1, K1

## Extended information

Teaching methods:

seminar

Type of classes	Credit forms	Course credit conditions
seminar	presentation	positive evaluation of presentation

## Prerequisites and additional requirements

The student should have mastered the basics of mathematics, combinatorics, and algorithms. They should know the concept of mathematical proof and be proficient in using formal mathematical notation. Passive knowledge of English at a level sufficient for independent reading of scientific texts.

## Literature

### Required

1. Articles from leading international journals and conferences.