

# UE Combinatorial optimization and graph theory



Niveau d'étude  
Bac +5



ECTS  
6 crédits



Crédits ECTS  
Echange  
6.0



Composante  
UFR IM2AG  
(informatique,  
mathématiques  
et  
mathématiques  
appliquées)



Période de  
l'année  
Automne (sept.  
à dec./janv.)

- > **Langue(s) d'enseignement:** Anglais
- > **Ouvert aux étudiants en échange:** Oui
- > **Crédits ECTS Echange:** 6.0
- > **Code d'export Apogée:** GBX9CO02

## Présentation

### Description

The aim of this course is to provide a broad knowledge of fundamental problems in Combinatorial Optimization to show their algorithmic solutions and to derive min-max results on them. In order to achieve this goal a new object called a polyhedron is introduced. This polyhedral approach helps to shed new light on some classic results of Combinatorial Optimization.

Syllabus: Study of polyhedra associated to problems of Combinatorial Optimization ; Theory of blocking polyhedra ; Connectivity: shortest paths, spanning trees and spanning arborescences of minimum weight ; Flows: Edmonds-Karp Algorithm, Goldberg-Tarjan Algorithm, minimum cost flows ; Matchings: Hungarian method, Edmonds' Algorithm, Chinese postman problem; Matroids: greedy algorithm, intersection of two matroids ; Graph coloring ; Applications coming from various areas of Operations Research.

### Heures d'enseignement

CM CM 36h

**Période :** Semestre 9

# Infos pratiques

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## Contacts

Responsable pédagogique

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## Lieu(x) ville

› Grenoble

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## Campus

› Grenoble - Domaine universitaire