

UE Graph and discrete structures



Niveau d'étude
Bac +5



ECTS
3 crédits



Crédits ECTS
Echange
3.0



Composante
UFR
Informatique,
mathématiques
et
mathématiques
appliquées
(IM2AG)



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

Diplômes intégrant cet élément

- Master Informatique

- > **Langue(s) d'enseignement:** Anglais
- > **Méthodes d'enseignement:** En présence
- > **Forme d'enseignement :** Cours magistral
- > **Ouvert aux étudiants en échange:** Oui
- > **Crédits ECTS Echange:** 3.0
- > **Code d'export Apogée:** GBX9CO06

Présentation

Description

The aim of this course is to learn how to use the structure of graphs and other discrete objects to obtain general results on them, and in particular efficient algorithms solving important problems.

We will cover the following topics:

- **Structural Graph Theory:** we will study the structure of important graph classes with nice algorithmic properties (planar graphs, interval graphs, comparability graphs, ...) and show several concrete problems that can be solved thanks to their structural properties.

- Graph Drawing: with the rise of Big Data, representing huge data sets is a fundamental challenge. Efficient ways to represent large graphs will be presented.
- Codes: we will see various codes (dominating, locating, identifying, ...) in graphs and their applications.
- Extremal combinatorics: the typical question in this field is "what global condition do we need to impose in some graph in order to make sure that some nice structure appears locally?" We will introduce a powerful tool called "the probabilistic method", and show how it can be applied to solve problems in this important area of research.

Heures d'enseignement

CM CM 18h

Période : Semestre 9

Infos pratiques

Contacts

Responsable d'UE

Louis Esperet

✉ louis.esperet@grenoble-inp.fr

Lieu(x) ville

➤ Grenoble

Campus

➤ Grenoble - Domaine universitaire