Grenoble INP

Master in Computer science

Operations Research, Combinatorics and Optimisation (ORCO) 2nd year

Presentation

Semester 9 corresponds to the specialization training, semester 10 consists of a practicum in a company or laboratory of 5 to 7 months, which represents 27 European credit transfer and accumulation system credits.

Objectives

The scientific objectives are to train students in the foundations and methods of operational research (mathematical programming, graph theory, complexity, stochastic programming, heuristics, approximation algorithms etc) and to prepare students to use and develop these methods to solve complex industrial applications (supply chain, scheduling, transport, revenue management etc) and implement the corresponding software solutions.

Students departing from this course intend to, depending on their preferences :

- Orient themselves towards the research professions (academic or industrial thesis)
- Enter, as a specialist engineer, major research and development services in optimization (SNCF, IBM, Air France, Amadeus etc) or enter consulting firms in optimization (Eurodécision, Artelys etc)

They will also be able to enter less specialized companies by highlighting their ability to methodologically analyse operational problems and thus displaying themselves as potential key elements in the improvement of the company's performance (by linking up with specialized firms or developing in-house methods). In the longer term, students who are oriented towards the industrial world should be able, with their experience in improving company performance and good "business" knowledge, to naturally access decision-making positions at high levels of responsibility.

Registration and scholarships

The second year master's is accessible to candidates according to their transcripts (and/or interview) :

- Having validated the first year of a compatible course - or by validating studies or acquired experience according to the conditions determined by the university or the training

Public continuing education : You are in charge of continuing education :

- if you resume your studies after 2 years of interruption of studies
- or if you followed a formation under the regime formation continues one of the 2 preceding years
- or if you are an employee, job seeker, self-employed

If you do not have the diploma required to integrate the training, you can undertake a validation of personal and professional achievements (VAPP)

Would you like to apply and register ? Please note that the procedure differs depending on the degree, the diploma obtained, or the place of residence for foreign students.

- **You are a non-EU citizen, resident in (*you live in one of these countries*) :**

Algeria, Argentina, Benin, Brazil, Burkina Faso, Cameroon, Chile, China, Colombia, Comoros, Congo, Egypt, Indonesia, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mexico, Morocco, Peru, Russia, Senegal, South Korea, Syria, Taiwan, Togo, Tunisia, Turkey, Vietnam.

Apply for studies in France **and** on FSA

For other applicants : Apply Now

Further studies

This program allows students to write a thesis. Its strong industrial basis especially allows students to find industrial theses with very good conditions (CIFRE, contract...)

Practicals informations :

> **School :** Grenoble INP, UFR IM2AG (informatique, mathématiques et mathématiques appliquées)
> **Duration :** 1 year
> **Course type :** Initial and Continuing Education
> **Location(s) :** Grenoble - University campus
> **Contacts :**

Programme director

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Program

Master 2nd year

Semester 9

UE Advanced models and methods in operations research	6 ECTS	36h
UE Combinatorial optimization and graph theory	6 ECTS	36h
UE Optimization under uncertainty	6 ECTS	36h

4 option (s) to choose from 8

UE Logistic and transport	3 ECTS	18h
UE Scheduling	3 ECTS	18h
UE Graph and discrete structures	3 ECTS	18h
UE Advanced heuristic and approximation algorithms	3 ECTS	18h
UE Advanced mathematical programming methods	3 ECTS	18h
UE Efficient methods in optimization	3 ECTS	18h
UE Parallel systems	6 ECTS	36h
UE Academic and industrial challenges	3 ECTS	18h

Semester 10

UE Practicum	30 ECTS