SCIENCES, TECHNOLOGIES AND HEALTH

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

Master in Computer science

Duration
1 year

Component
Grenoble INP, Institut d'ingénierie et de management - UGA, UFR IM2AG (informatique, mathématiques et mathématiques appliquées)

Language(s) of instruction
English

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.

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.

Skills

Some teaching units of the program, of common core or labelled research, allow students to acquire organizational skills and skills related to research work :
- Formulate a research problem and propose a solution
- Position a research problem in the scientific literature

- Evaluate and validate a solution to a research problem
- Write a scientific publication
- Communicating the results of research work
- Develop and use mathematical and computer tools
- Communicate in English and French

International education : Internationally-oriented programmes

Organisation

Admission

Access conditions

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)

Candidature / Application

Do you want to apply and register? Note that the procedure differs depending on the degree considered, the degree obtained, or the place of residence for foreign students.

Find out which procedure applies to me and apply

Fees

Tuition fees 2019-2020 : 243 €

And after

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...)

Sector(s)

- Operational research engineer
- Logistics engineering engineer
- Optimization development engineer
- R&D engineer in operations research
- Teacher/researcher in operational and combinatorial research

Useful info

Contacts

Program director

Van Dat Cung
van-dat.cung@grenoble-inp.fr

Program director

Matej Stehlik
matej.stehlik@univ-grenoble-alpes.fr

Program administration

Cecile Gros
cecile.gros@univ-grenoble-alpes.fr

Course location(s) - City

Grenoble

Campus

Grenoble - University campus

Program

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Advanced models and methods in operations research	Teaching Unit (UE)	36h			6 credits
UE Combinatorial optimization and graph theory	Teaching Unit (UE)	36h			6 credits
UE Optimization under uncertainty	Teaching Unit (UE)	36h			6 credits
UE Logistic and transport	Teaching Unit (UE)	18h			3 credits
UE Scheduling	Teaching Unit (UE)	18h			3 credits
UE Graph and discrete structures	Teaching Unit (UE)	18h			3 credits
UE Advanced heuristic and approximation algorithms	Teaching Unit (UE)	18h			3 credits
UE Advanced mathematical programming methods	Teaching Unit (UE)	18h			3 credits
UE Efficient methods in optimization	Teaching Unit (UE)	18h			3 credits
UE Parallel systems	Teaching Unit (UE)	36h			6 credits
UE Academic and industrial challenges	Teaching Unit (UE)	18h			3 credits

Semester 10

	Nature	CM	TD	TP	Crédits
UE Practicum	Teaching Unit (UE)				30 credits