

Master in Computer science

Master of Science in Informatics at Grenoble (MoSIG)

Presentation

The training covers a wide spectrum at the level of the first year Master's trains graduates with a general education and foundation solid in computer science (in terms of programming languages, databases, networks, software engineering, object-oriented design/programming, complexity, and interactive software); the second year of the Master's allows students to acquire organizational skills related to research work and to become specialized in a field of computer science in connection with the numerous options offered (Information Systems and Advanced Software Engineering, Human-Centred Computer Science - Design of highly reliable embedded and cyberphysical systems, Artificial Intelligence and Web - Graphics, Vision, and Robotics, Interactive and Ubiquitous Systems, and Embedded, Parallel, and Distributed Systems). The objective is to give the necessary foundations for a job in research and development as well as to undertake a thesis in Computer Science in the fields covered by academic and industrial laboratories.

The research community on which this training is based is internationally recognized and has significant visibility.

Objectives

The aim of the course is to carry out high-level training in computer science for teaching, research, engineering, and development.

Registration and scholarships

The M1 is accessible on file (and / or interview) to the candidates:

- with a national diploma conferring the degree of license in a field compatible with that of the master
- or via a validation of studies or achievements according to the conditions determined by the university or the training.

The M2 is accessible on file (and / or interview) to the candidates:

- having validated the 1st year of a compatible course
- or via a validation of studies or achievements 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?

Be aware that the procedure differs depending on the diploma, the degree obtained, or the place of residence for foreign students.

- You are a candidate who is not a citizen of the European Union, residing in Algeria, Argentina, Benin, Brazil, Burkina Faso, Cameroon, Chile, China, Colombia, Comoros, Congo, South Korea, Ivory Coast, Egypt, United States, Gabon, Guinea, India, Indonesia, Iran, Japan, Lebanon, Madagascar, Mali, Morocco, Mauritius, Mauritania, Mexico, Peru, Russia, Senegal, Syria, Taiwan, Togo, Tunisia, Turkey, Vietnam.

[Candidate on studies in France](#)

and

[on FSA](#)

For the other applicants

[Candidate](#)

Further studies

Ph.D.

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 MoSIG 1st year

Semester 7

UE Programming language and compiler design	6 ECTS	66h
UE Software engineering	3 ECTS	30h
UE Principles of operating systems	6 ECTS	66h
UE Algorithms and program design	3 ECTS	33h

UE Mathematics for computer science	3 ECTS	36h
UE Technical writing and speaking	3 ECTS	27h
UE Introduction to visual computing	3 ECTS	33h
1 option (s) to choose from 2		
UE Programming project (OS)	3 ECTS	

UE Programming project (Compiler design)	3 ECTS
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Semester 8

UE Research project (TER)	3 ECTS
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UE Research methodology	3 ECTS	7,5h
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8 option (s) to choose from 12

UE Introduction to modeling and verification of digital systems	3 ECTS	30h
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UE Operations research	3 ECTS	36h
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UE Data base foundations	3 ECTS	36h
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UE Introduction to distributed systems	3 ECTS	33h
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UE Human computer interaction	3 ECTS	36h
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UE Intelligent systems: reasoning and recognition	3 ECTS	36h
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UE Computer networks principles	3 ECTS	36h
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UE 3D graphics	3 ECTS	36h
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UE Robotics and IoT	3 ECTS	33h
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UE Introduction to cryptology	3 ECTS	36h
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UE Parallel algorithms and programming	3 ECTS	33h
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UE Fundamental Computer Science	3 ECTS	30h
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Master MoSIG-AISSE 2nd year

Semester 9

UE Architecture : components and services	3 ECTS	18h
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UE Data management in large-scale distributed systems	3 ECTS	18h
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UE Model driven engineering	3 ECTS	18h
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UE Process engineering	3 ECTS	18h
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UE Requirements engineering	3 ECTS	18h
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UE Verification and test theories	3 ECTS	18h
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3 option (s) to choose from 6

UE Engineering human-computer interaction	6 ECTS	36h
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UE Scientific methodology and performance evaluation	3 ECTS	18h
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UE Software mining and re-engineering	3 ECTS	18h
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UE Software security, secure programming and computer forensics	3 ECTS	39h
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UE Temporal and spatial informations	3 ECTS	18h
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UE Information access and retrieval	3 ECTS	18h
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Semester 10

UE Research project	30 ECTS
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Master MoSIG-AIW 2nd year

Semester 9

UE Advanced algorithms for machine learning and data mining	3 ECTS	18h
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UE Knowledge representation and reasoning	6 ECTS	36h
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UE Machine learning fundamentals	3 ECTS	18h
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UE Semantic Web : from XML to OWL	6 ECTS	36h
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UE other master's specialisations

Semester 10

UE Research project	30 ECTS
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Master MoSIG-GVR 2nd year

Semester 9

UE Computer vision	6 ECTS	36h
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UE Computer graphics II	6 ECTS	36h
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UE Autonomous robotics	6 ECTS	36h
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3 option (s) to choose from 7

UE Category learning and object recognition	3 ECTS	18h
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UE Computational geometry	3 ECTS	18h
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UE Human-centered interaction	6 ECTS	36h
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UE Machine learning fundamentals	3 ECTS	18h
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UE Medical imaging, simulation and robotics	3 ECTS	18h
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UE Scientific methodology and performance evaluation	3 ECTS	18h
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UE Numerical optimal transport and geometry	3 ECTS	18h
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Semester 10

UE Research project 30 ECTS

Master MoSIG-DI 2nd year

Semester 9

UE Advanced aspects of operating systems	3 ECTS	36h
UE Advanced Data Networks	6 ECTS	36h
UE Parallel systems	6 ECTS	36h
UE Software infrastructure for data centers and Cloud computing	3 ECTS	18h
3 option (s) to choose from 4		
UE Scientific methodology and performance evaluation	3 ECTS	18h
UE Wireless networks	3 ECTS	18h
UE Distributed system	3 ECTS	18h
UE Security architecture : network, system, key management, cybersecurity of industrial IT	6 ECTS	78h

Semester 10

UE Research project 30 ECTS

Master MoSIG-HECS 2nd year

Semester 9

UE Verification of sequential programs	6 ECTS	18h
UE SAT/SMT Solving	3 ECTS	18h
UE Models and languages for model checking	3 ECTS	18h
UE Advanced verification technics and applications	3 ECTS	18h
UE Feedback control and real times systems	3 ECTS	18h
UE Probabilistics, timed, and hybrid systems	3 ECTS	18h
3 option (s) to choose from 3		
UE Requirements engineering	3 ECTS	18h
UE Software security, secure programming and computer forensics	3 ECTS	39h
UE Industrial processes for high-confidence design	6 ECTS	36h

Semester 10

UE Research project 30 ECTS

Master MoSIG-UIS 2nd year

Semester 9

UE Engineering human-computer interaction	6 ECTS	36h
UE Human-centered interaction	6 ECTS	36h
UE Information visualization	3 ECTS	18h
3 option (s) to choose from 3		
UE Computer vision	6 ECTS	36h
UE Machine learning fundamentals	3 ECTS	18h
UE Scientific methodology and performance evaluation	3 ECTS	18h

Semester 10

UE Research project 30 ECTS

Master MoSIG-Data Sciences 2nd year

Semester 9

UE Advanced learning models	3 ECTS	18h
UE Convex and distributed optimization	3 ECTS	18h
UE High performance computing for mathematical models	3 ECTS	18h
UE Fundamentals of probabilistic data mining	3 ECTS	18h
UE Data management in large-scale distributed systems	3 ECTS	18h
UE Machine learning fundamentals	3 ECTS	18h
UE Advanced algorithms for machine learning and data mining	3 ECTS	18h
UE Distributed system	3 ECTS	18h
2 option (s) to choose from 10		
UE Computational biology	3 ECTS	18h
UE Monte-Carlo methods in financial engineering	3 ECTS	18h
UE Stochastic modelling for neurosciences	3 ECTS	18h
UE Information access and retrieval	3 ECTS	18h
UE Category learning and object recognition	3 ECTS	18h

UE Data challenges	3 ECTS	18h
UE Information visualization	3 ECTS	18h
UE Data science seminar	3 ECTS	14h
UE Model selection for large-scale learning	3 ECTS	18h
UE Numerical optimal transport and geometry	3 ECTS	18h

Semester 10

UE Research project	30 ECTS
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