

Master in Computer science

## Master of Science in Informatics at Grenoble (MoSIG)

### Presentation

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

The initial semester (Master1 - S7) is composed of foundational courseware

The second semester (Master1 - S8) combines core foundational courseware with optional specialization courses.

For the semester S9 of 30 ECTS, students need to select courses worth 24 ECTS in their chosen theme (according to their initial training) and 6 ECTS of courses from a different theme, if timetables are consistent and enrollment restrictions apply.

The final semester (Master2 - S10) is dedicated to an end of studies research (or professional) project.

The course is labelled "Core AI" by [MIAI](#).

[Mosig master website](#)

### Registration and scholarships

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The first year of master's degree is accessible on file (and / or interview) to 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 acquired according to the conditions determined by the university or training. 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 \(VAPP\)](#)

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](#)

## Further studies

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Ph.D.

## Practicals informations :

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- > Component : UFR IM2AG (informatique, mathématiques et mathématiques appliquées), Grenoble INP - Ensimag (Informatique, mathématiques appliquées et télécommunications)
- > level : Bacalauréat +5
- > Duration : 2 years
- > Course type : Initial and Continuing Education
- > Location(s) : Grenoble - University campus

## Contacts

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### Program director

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## Program

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Program under construction - awaiting vote  
 CFVU

### Master 1st year

#### Semester 7

<b>UE Programming language and compiler design</b>	6 ECTS
<b>UE Software engineering</b>	3 ECTS

<b>UE Principles of operating systems</b>	6 ECTS
<b>UE Algorithms Problem Solving</b>	3 ECTS
<b>UE Mathematics for computer science</b>	3 ECTS
<b>UE Introduction to visual computing</b>	3 ECTS
<b>UE Technical writing and speaking</b>	3 ECTS
1 option(s) to choose from 2	
<b>UE Programming project (OS)</b>	3 ECTS

<b>UE Programming project (Compiler design)</b>	3 ECTS
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## Semester 8

<b>UE Research project (TER)</b>	3 ECTS
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<b>UE Research methodology</b>	3 ECTS
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8 option(s) to choose from 13

<b>UE Introduction to modeling and verification of digital systems</b>	3 ECTS
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<b>UE Operations Research</b>	3 ECTS
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<b>UE Data base foundations</b>	3 ECTS
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<b>UE Introduction to distributed systems</b>	3 ECTS
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<b>UE Human computer interaction</b>	3 ECTS
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<b>UE Intelligent systems: reasoning and recognition</b>	3 ECTS
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<b>UE Computer networks principles</b>	3 ECTS
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<b>UE 3D graphics</b>	3 ECTS
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<b>UE Robotics and IoT</b>	3 ECTS
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<b>UE Introduction to cryptology</b>	3 ECTS
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<b>UE Parallel algorithms and programming</b>	3 ECTS
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<b>UE Fundamental Computer Science</b>	3 ECTS
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<b>UE Foundations of Data Science</b>	3 ECTS
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## Master Data science and artificial intelligence (DSAI) 2nd year

### Semester 9

<b>UE Advanced algorithms for machine learning and data mining</b>	3 ECTS
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<b>UE Information access and retrieval</b>	3 ECTS
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<b>UE Machine learning fundamentals</b>	3 ECTS
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<b>UE Reinforcement learning</b>	3 ECTS
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<b>UE Kernel methods for machine learning</b>	3 ECTS
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<b>UE GPU Computing</b>	6 ECTS
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<b>UE Model selection for large-scale learning</b>	3 ECTS
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<b>UE Fundamentals of Data Processing and Distributed Knowledge</b>	6 ECTS
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<b>UE Knowledge representation and reasoning</b>	6 ECTS
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<b>UE Large scale Data Management and Distributed Systems</b>	6 ECTS
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<b>UE Scientific Methodology, Regulatory and ethical data usage</b>	6 ECTS
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<b>UE Multi-agent systems</b>	3 ECTS
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<b>UE Natural Language Processing</b>	3 ECTS
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<b>UE Information visualization</b>	3 ECTS
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<b>UE Machine Learning for Multimodal Data</b>	3 ECTS
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### Semester 10

<b>UE Research project</b>	30 ECTS
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Master Distributed computing : from cloud to edge computing, embedded systems and networking (DC) 2nd year

### Semester 9

<b>UE Advanced networking</b>	6 ECTS
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<b>UE Advanced parallel system</b>	6 ECTS
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<b>UE System design: concurrency, realtime, stochastics, and analog/digital</b>	6 ECTS
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<b>UE Cloud Computing, from infrastructure to applications</b>	6 ECTS
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<b>UE Scientific Methodology, Regulatory and ethical data usage</b>	6 ECTS
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<b>UE Large scale Data Management and Distributed Systems</b>	6 ECTS
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<b>UE Embedded systems: from high-confidence design to safe execution</b>	6 ECTS
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<b>UE SAT/SMT solving</b>	3 ECTS
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<b>UE Program testing and verification</b>	3 ECTS
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### Semester 10

<b>UE Research project</b>	30 ECTS
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Master Human and digital world interactions : robotics, augmented and virtual reality, perception (HDWI) 2nd year

### Semester 9

5 option(s) to choose from 6

<b>UE Augmented and virtual reality: innovative interaction techniques</b>	6 ECTS
<b>UE Computer Graphics</b>	6 ECTS
<b>UE Human in the Loop</b>	6 ECTS
<b>UE Robotics</b>	6 ECTS
<b>UE Computer vision</b>	6 ECTS
<b>UE Scientific Methodology, Regulatory and ethical data usage</b>	6 ECTS

## Semester 10

<b>UE Research project</b>	30 ECTS
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## Master Software and hardware components engineering: quality engineering, models of computation (SHCE) 2nd year

### Semester 9

<b>UE Advanced software modeling and engineering</b>	6 ECTS
<b>UE Embedded systems: from high-confidence design to safe execution</b>	6 ECTS
<b>UE Process engineering</b>	6 ECTS
<b>UE SAT/SMT solving</b>	3 ECTS
<b>UE Program testing and verification</b>	3 ECTS
<b>UE System design: concurrency, realtime, stochastics, and analog/digital</b>	6 ECTS
<b>UE Cloud Computing, from infrastructure to applications</b>	6 ECTS
<b>UE Large scale Data Management and Distributed Systems</b>	6 ECTS
<b>UE Advanced parallel system</b>	6 ECTS

### Semester 10

<b>UE Research project</b>	30 ECTS
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