



Academic Year 2017-2018

Master of Science in **Computer Science**  
**Classe LM-18 (Informatica) ex D.M. 270/04**

# Short Summary of Degree Regulations and Requirements

Full version (in italian) is available here:

<http://www.studiareinformatica.uniroma1.it/laurea-magistrale/regolamento-didattico>



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# Degree Program

Primary Topic Coursework		
Discipline	Sectors	CFU
Primary Topic Coursework	INF/01 Computer Science	54
<b>Primary Topic Coursework: Total CFU</b>		54
Supplementary Coursework		
Discipline	Sectors	CFU
Supplementary Coursework	FIS/01 Experimental Physics INF/01 Computer Science MAT/07 Mathematical Physics SECS-P/07 Business Economy	12
<b>Supplementary Coursework: Total CFU</b>		12
Other Educational Activities and Coursework		
Discipline	CFU	
Elective Coursework	12	
Master's Thesis and Presentation	36	
Additional language skills	0	
Computer skills	0	
Apprenticeships	0	
Preparation and skills for the job market	6	
Internships and apprenticeships in industry	0	
<b>Total CFU in Other Educational Activities and Coursework</b>		54
<b>Total CFU required for graduation</b>		120



## Degree Program in Detail

Course	Mandatory	Year	CFU	SSD	Scope
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Primary Topic course	Yes	I/II	6	INF/01	Primary Topic Coursework
Supplementary course	Yes	I/II	6		Supplementary Coursework
Supplementary course	Yes	I/II	6		Supplementary Coursework
Elective course	Yes	I/II	12		Students choice
Subsidiary Formative Activities	Yes	II	6		Further job and technical skills
Master's Thesis and presentation	Yes	II	36		
Total			120		

To obtain the 12 CFU satisfying the Elective Coursework requirement, the student may choose from courses available in any degree program delivered by Sapienza University, provided that the courses are coherent with the student's study plan.



## Degree Tracks

The Master of Science in Computer Science is divided into four tracks:

- Software Engineering.
- Multimedia Computing and Interaction.
- Information Science and Applications.
- Networks and Security.

In order for the student to obtain the degree, they must complete:

- 54 CFU for Primary Topic Coursework, chosen from the tables for **Core and Integrative Courses**, following the scheme for each degree track.
- 12 CFU for Supplementary Coursework, chosen from the **Comprehensive Table of Courses**.
- 12 CFU for Elective Courses chosen by the student, provided the courses are coherent with the study plan.
- 6 CFU for **Subsidiary Formative Activities**.
- 36 CFU for the Master thesis and presentation.

The **Comprehensive Table of Courses** contains all courses within the Master of Science in Computer Science. Students are not allowed to choose the same course twice.



## Software Engineering

The student must choose:

- 4 courses from the **Table of Core Courses**, specific for this curriculum.
- 5 courses from the **Table of Integrative Courses**, specific for this curriculum.
- 2 courses from the **Comprehensive Table of Courses**.
- 2 courses from the **Comprehensive Table of Courses** or other courses delivered by Sapienza University, provided the courses are coherent with the student's study plan.

### Table of Core Courses

Course	Year	CFU	SSD	Scope
Advanced Software Engineering	I	6	INF/01	Primary Topic
Automatic Software Verification Methods	II	6	INF/01	Primary Topic
Concurrent Systems	II	6	INF/01	Primary Topic
Formal Methods in Software Development	I	6	INF/01	Primary Topic
Security in Software Applications	I	6	INF/01	Primary Topic

### Table of Integrative Courses

Course	Year	CFU	SSD	Scope
Big Data Computing	I	6	INF/01	Primary Topic
Cloud Computing	I	6	INF/01	Primary Topic
Distributed Systems	I	6	INF/01	Primary Topic
Human Computer Interaction on the Web	I	6	INF/01	Primary Topic
Machine Learning	I	6	INF/01	Primary Topic
Mathematical Logic for Computer Science	I	6	INF/01	Primary Topic
Models of Computation	I	6	INF/01	Primary Topic



## Multimedia Computing and Interaction

The student must choose:

- 5 courses from the **Table of Core Courses**, specific for this curriculum.
- 4 courses from the **Table of Integrative Courses**, specific for this curriculum.
- 2 courses from the **Comprehensive Table of Courses**.
- 2 courses from the **Comprehensive Table of Courses** or other courses delivered by Sapienza University, provided they are coherent with the study plan.

### Table of Core Courses

Course	Year	CFU	SSD	Scope
Biometric Systems	I	6	INF/01	Primary Topic
Computer Vision	II	6	INF/01	Primary Topic
Fundamentals of Computer Graphics	II	6	INF/01	Primary Topic
Human Computer Interaction on the Web	I	6	INF/01	Primary Topic
Machine Learning	I	6	INF/01	Primary Topic
Multimodal Interaction	II	6	INF/01	Primary Topic
Natural Language Processing	I	6	INF/01	Primary Topic
Web and Social Information Extraction	I	6	INF/01	Primary Topic

### Table of Integrative Courses

Course	Year	CFU	SSD	Scope
Advanced Software Engineering	I	6	INF/01	Primary Topic
Big Data Computing	I	6	INF/01	Primary Topic
Cloud Computing	I	6	INF/01	Primary Topic
Computer Networks Performance	I	6	INF/01	Primary Topic
Concurrent Systems	II	6	INF/01	Primary Topic
Distributed Systems	I	6	INF/01	Primary Topic
Formal Methods in Software Development	I	6	INF/01	Primary Topic



## Information Science and Applications

The student must choose:

- 6 courses from the **Table of Core Courses**, specific for this curriculum. The following rules apply:
  - a. the student can choose at most one course from **Computer Network Performance** and **Security in Software Applications**;
  - b. the student can choose at most one course from **Fundamentals of Computer Graphics** and **Computer Vision**.
- 3 courses from the **Table of Integrative Courses**, specific for this curriculum.
- 2 courses from the **Comprehensive Table of Courses**.
- 2 courses from the **Comprehensive Table of Courses** or from any other course delivered by Sapienza, provided they are coherent with the study plan.

When choosing the integrative courses and/or the elective courses, it is suggested (but not mandatory) that the student choose at most one (1) course from each of the following groups:

<b>Systems</b>	<b>Multimedia</b>	<b>Software Engineering</b>
<ul style="list-style-type: none"><li>• Advanced Parallel Architectures</li><li>• Distributed Systems</li><li>• Information Systems</li><li>• Topics in Physics</li></ul>	<ul style="list-style-type: none"><li>• Human Computer Interaction on the Web</li><li>• Machine Learning</li><li>• Social and Behavioral Network</li><li>• Web and Social Information Extraction</li></ul>	<ul style="list-style-type: none"><li>• Concurrent Systems</li><li>• Automatic Software Verification Methods</li><li>• Intensive Computation</li></ul>

### Table of Core Courses

<b>Course</b>	<b>Year</b>	<b>CFU</b>	<b>SSD</b>	<b>Scope</b>
Advanced Algorithms	II	6	INF/01	Primary Topic
Big Data Computing	I	6	INF/01	Primary Topic
Computer Networks Performance	I	6	INF/01	Primary Topic
Computer Vision	II	6	INF/01	Primary Topic
Fundamentals of Computer Graphics	II	6	INF/01	Primary Topic





Graph Theory	I	6	INF/01	Primary Topic
Mathematical Logic for Computer Science	I	6	INF/01	Primary Topic
Models of Computation	I	6	INF/01	Primary Topic
Network Algorithms	II	6	INF/01	Primary Topic
Security in Software Applications	I	6	INF/01	Primary Topic

### Table of Integrative Courses

Course	Year	CFU	SSD	Scope
Computational Complexity	II	6	INF/01	Primary Topic
Cryptography	I	6	INF/01	Primary Topic
Elective in Networking and Systems	II	6	INF/01	Primary Topic



## Networks and Security

The student must choose:

- 5 courses from the **Table of Core Courses**, specific for the curriculum.
- 4 courses from the **Table of Integrative Courses**, specific for the curriculum.
- 2 courses from the **Comprehensive Table of Courses**.
- 2 courses from the **Comprehensive Table of Courses** or from any other course delivered by Sapienza, provided they are coherent with the study plan.

### Table of Core Courses

Course	Year	CFU	SSD	Scope
Computer Networks Performance	I	6	INF/01	Primary Topic
Cryptography	I	6	INF/01	Primary Topic
Distributed Systems	I	6	INF/01	Primary Topic
Elective in Networking and Systems	II	6	INF/01	Primary Topic
Internet of Things	II	6	INF/01	Primary Topic
Data and Network Security	II	6	INF/01	Primary Topic

### Table of Integrative Course

Course	Year	CFU	SSD	Scope
Advanced software engineering	I	6	INF/01	Primary Topic
Automatic Software Verification Methods	II	6	INF/01	Primary Topic
Cloud Computing	I	6	INF/01	Primary Topic
Concurrent Systems	II	6	INF/01	Primary Topic
Human Computer Interaction on the Web	I	6	INF/01	Primary Topic
Intensive Computation	II	6	INF/01	Primary Topic
Machine Learning	I	6	INF/01	Primary Topic
Multimodal Interaction	II	6	INF/01	Primary Topic
Network Algorithms	II	6	INF/01	Primary Topic
Security in Software Applications	I	6	INF/01	Primary Topic
Social and Behavioral Networks	I	6	INF/01	Primary Topic



## Comprehensive Table of Courses

Course	Year	CFU	SSD	Scope
Advanced Algorithms	II	6	INF/01	Supplementary
Network Algorithms	II	6	INF/01	Supplementary
Advanced software engineering	I	6	INF/01	Supplementary
Automatic Software Verification Methods	II	6	INF/01	Supplementary
Big Data Computing	I	6	INF/01	Supplementary
Biometric Systems	I	6	INF/01	Supplementary
Cloud Computing	I	6	INF/01	Supplementary
Computational complexity	II	6	INF/01	Supplementary
Computer Networks Performance	I	6	INF/01	Supplementary
Computer Vision	II	6	INF/01	Supplementary
Concurrent Systems	II	6	INF/01	Supplementary
Cryptography	I	6	INF/01	Supplementary
Data and Network Security	II	6	INF/01	Supplementary
Distributed Systems	I	6	INF/01	Supplementary
Elective in Networking and Systems	II	6	INF/01	Supplementary
Formal Methods in Software Development	I	6	INF/01	Supplementary
Foundations of Data Science	I	6	INF/01	Supplementary
Fundamentals of Computer Graphics	II	6	INF/01	Supplementary
Graph Theory	I	6	INF/01	Supplementary
Human Computer Interaction on the Web	I	6	INF/01	Supplementary
Information Systems	II	6	SECS-P/07	Interdisciplinary



Intensive Computation	II	6	INF/01	Supplementary
Internet of Things	II	6	INF/01	Supplementary
Machine Learning	I	6	INF/01	Supplementary
Mathematical Logic for Computer Science	I	6	INF/01	Supplementary
Models of Computation	I	6	INF/01	Supplementary
Multimodal Interaction	II	6	INF/01	Supplementary
Natural Language Processing	I	6	INF/01	Supplementary
Security in Software Applications	I	6	INF/01	Supplementary
Social and Behavioral Networks	I	6	INF/01	Supplementary
Topics in Physics	II	6	FIS/01	Related
Web and Social Information Extraction	I	6	INF/01	Supplementary
Wireless Systems	I	6	INF/01	Supplementary



## Subsidiary Formative Activity

As part of completing the Master of Science in Computer Science, students are expected to attend one of the **Subsidiary Formative Activities** (6 CFU) listed below. The Subsidiary Formative Activity is completed during the student's second year in addition to traditional courses and they are available every academic year. The goal is to create cross-topic competencies with the goal of facilitating the student's integration in the labour market.

For the Academic Year 2017-2018, the following Subsidiary Formative Activities will be taught:

Course	CFU
System-level design and verification of cyber-physical systems	6
Legolab	6
Gamification Lab	6
Network Design and Management	6
Cyber-Security Lab	6

Additional information are available at the following web page:

<http://www.studiareinformatica.uniroma1.it/laurea-magistrale/attivita-formative-complementari>



# General Regulations

## Study Plans and Individual Study Plans

Before a student can register to take an exam for any course, their complete Study Plan must be approved by the CAD. The student can submit their Study Plan for approval in two ways:

1. Choose one of the standard **Study Plans** available; there is a pre-made Study Plan available for each of the four degree tracks;
2. Submit an **Individual Study Plan**.

In each case, the student must submit their proposal through the online platform that can be found through the Infostud system:

Home > Degree Programmes (*Corsi di laurea*) > Educational Career (*Percorso formativo*)

### Study Plans

To submit a Study Plan the student must:

1. select one of the four degree tracks;
2. select 9 courses from the two available groups, following the rules for the selected degree track;
3. select 2 courses from those available to the student as shown by the online platform;
4. select one or more course amounting to the required Elective course 12 CFU. These courses can be chosen from all courses available at Sapienza University.

Once completed, the Study Plan must be submitted for approval. If the Study Plan is not approved, the student must modify the 12 CFU at their choice.

### Individual Study Plan

To submit an Individual Study Plan the student must:

1. select 9 courses from those available in the Tables of Courses of at least one of the four curricula;
2. select 2 courses from those available to the student, shown by the online platform;



3. select one or more courses amounting to the 12 CFU to fulfil the elective course requirement. These courses can be chosen from all the courses delivered by Sapienza.

Once completed, the Individual Study Plan must be submitted for approval.

## Changing the Study Plan

Once the Study Plan or Individual Study Plan has been submitted and approved, it is possible to change it only in the following academic year. Courses that have already been completed with exam grades registered must appear in the new study plan.

## Didactic Methods

The Master of Science in Computer Science program is four semesters, or two years.

## CFU

The CFU (*Credito Formativo Universitario*) measures the amount of work done by the student.

One CFU counts for:

- 8 hours of lectures, or
- 12 hours of laboratory activity or guided practice, or
- 20 hours of professional training (under supervision of a professor) or assisted study (with teaching assistants).

## Academic Calendar

The academic calendar is divided into two semesters and three exam periods, approximately as follows:

- the first semester runs from the end of September to the end of December;
- the second semester runs from the end of February to mid June;
- the first exam session is held from January to the end of February;
- the second exam session is held from the start of June to the end of July;
- the third exam session is held in September;
- extraordinary exam sessions are held in April and November, reserved for “fuoricorso” students, working students, and students who are graduating in the following



graduation session (respectively, July and January) and who can certify their status as graduating students.

A detailed academic calendar is available on the course website:

<http://www.studiareinformatica.uniroma1.it/calendario-didattico>

For each course there are:

- two exams in the exam session immediately following the end of the lectures (January-February for first semester courses, June-July for second semester courses);
- three exams in the remaining exam sessions, one in September and the other two in the other exam session;
- two exams are reserved in April and November for “fuoricorso” students, working students, and graduating students; details are available on the course website.

Start and end dates for the exam sessions are available on the course website:

<http://www.studiareinformatica.uniroma1.it/master-course-computer-science/exam-sessions>

## Exams and Grades

Each course is graded either on a 30 point scale or by a simple pass grade. For courses graded on the 30 point scale, the minimum grade is 18/30. Alternatively, some courses are graded with a single pass mark when the student satisfactorily completes the course requirements.

The final grade for each course can be assessed as follows, as determined by the course administrator:

- a written exam, possibly divided into multiple written tests administered during the semester and at the end of the course, or alternatively, a single written exam administered at the end of the course;
- an oral exam;
- an individual project completed by the student.

## Part-time Studies

Deadlines, requirements, and procedures to enroll in a part-time degree are available at the following link (in italian): <http://uniroma1.it/node/5953>





## “Fuoricorso” Students

Students who do not fulfil all the requirements for the degree under the Degree Program within two years are considered “fuoricorso”.

- A full-time “fuoricorso” student must complete all exams required by their study plan within twice the regular length of time allowed for the completion of the degree.
- A part-time “fuoricorso” student must complete all exams required by their study plan within twice the length of time allowed for the completion of a part-time degree.

If these terms are not met by the “fuoricorso” student, the CAD will evaluate the situation on a case by case basis.

## Honours Programme

At the beginning of the second year, students have the possibility to participate in the Honours Programme (*Percorso di eccellenza*). Deadlines and requirements for participating in the Honours Programme are available on the course website:

[www.studiareinformatica.uniroma1.it/master-course-computer-science/honours-programme](http://www.studiareinformatica.uniroma1.it/master-course-computer-science/honours-programme)

## Thesis and Final Exam

The final requirement for the completion of the Master of Science in Computer Science is the presentation and discussion of a written Master’s Thesis. The preferred language for the thesis is English. The thesis must present the results of original study on an experimental or research problem or the development of an application.

The written thesis will undergo a check for originality and plagiarism. If the document does not pass the originality check, the student is not admitted to the final test consisting of an oral presentation of the thesis work.

The final grade is based on the course grades, the Master Thesis, and on the oral presentation of the thesis, as well as additional criteria designed to encourage students to complete the degree within the usual time frame. The final grade, as determined by the Graduate Committee, is on a scale of 110, and on unanimous decision, the committee can additionally grant the student the maximum grade with honours (*con lode*).