

## MASTER'S DEGREE in COMPUTER SCIENCE @ UNIPD A.Y. 2023/2024

The Master's Degree in Computer Science is organized by the Department of Mathematics and it is part of the School of Sciences. It is entirely taught in English. It aims at training highly specialized IT professionals. To this end, it provides a wide offer of course units that focus on various areas of computer science, both of foundational and applicative nature, with special emphasis on innovative themes and state-of-the-art technologies. Three main study paths are offered, referred to as **Majors**, namely “*Artificial Intelligence*” (**AI**), “*Internet, Mobile and Security*” (**IMS**), “*Programming Languages and Systems*” (**PLS**). These are complemented by smaller groups of course units, referred to as **Minors**, which focus on complementary themes such as “*Internet of Things and Embedded Systems*” (**ITES**), “*Data and process management*” (**DM**), and “*Innovation and entrepreneurship in ICT*” (**INN**).

The activities necessary to achieve the Master's Degree amount to 120 ECTS. Students who enroll in the academic year 2021/22, will get 78 ECTS by course units (typically 13 course units of 6 ECTS each): 12 ECTS are given by two compulsory course units: “*Computability*” and “*Advanced Algorithms*”, and 6 ECTS by the compulsory course unit “*Economics and management of innovation*”. The remaining 42 ECTS are obtained through 7 elective course units in computer science (“*caratterizzanti*”), 6 ECTS are obtained through an elective course unit in related fields (“*affini*”), and 12 ECTS are achieved through free-choice elective course units, which can be in any field (“*liberi*”). In addition, 3 ECTS are for English language. The teaching is organized in semesters and attending lessons, although not compulsory, is recommended. The master project (“*tesi di laurea magistrale*”) of 33 CFU can consist in the development of a research work or a project, possibly carried out during an internship in one of the partner organizations of the Master's Degree, ICT start-up incubators or in other highly innovative companies.

A study plan is automatically approved when it includes a **Major**, i.e., it includes at least 4 course units from the groups **AI**, **IMS** and **PLS** (see below). The remaining 3 course units in computer science can be freely chosen between Majors and Minors. Custom study plans not satisfying this rule can be discussed with the Mentoring Committee of the Master's Degree in Computer Science.

The **Majors** are

AI - Artificial Intelligence	IMS - Internet, Mobile and Security	PLS –Programming Languages, Systems and Algorithms
Artificial intelligence	Wireless networks for mobile applications	Functional languages
Deep learning	Mobile programming and multimedia	Languages for concurrency and distribution
Machine learning	Web information management	Software verification
Vision and cognitive systems	Runtimes for concurrency and distribution	Formal methods for cyberphysical systems
Natural Language Processing	Advanced topics in computer and network security	Selected topics in algorithms

while **Minors** are:

ITES – Internet of Things and Embedded Systems	DM - Data and process management	INN - Innovation and entrepreneurship in ICT
Mobile security	Process mining	IT service management
Real-time kernels and systems	Big data computing	Start up in ICT
Cyberphysical systems and IOT security	Knowledge representation and Learning	Security and risk: management and certifications

The study plan must include an additional course unit in fields related to CS (“affini”) in the following group. Such course units have natural connections with Majors/Minors, as indicated:

- Cryptography [IMS, ITES]
- Data mining [DM]
- Type theory [PLS]
- Game theory [AI, PLS]
- Bioinformatics [DM]
- Structural bioinformatics [AI]
- Mathematical models and numerical methods for big data [DM]
- Methods and models for combinatorial optimization [AI, IMS]

The information concerning teaching activities (instructors, class and exam schedules, graduation, study plans, etc.) are available and up to date at the website <http://informatica.math.unipd.it>.

The activities of the Master's Degree Course in Computer Science for students enrolling in the academic year 2023/24 and their overall organization is reported in the table attached.