



# LM Computer Science

## LM Informatica

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AY/AA 2024/2025



DEPARTMENT OF

INFORMATION ENGINEERING AND COMPUTER SCIENCE

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# LM Computer Science – generic learning objectives

Graduates of the master's degree courses of the class must:

- have solid knowledge of both the **fundamentals and the applicative aspects of the various sectors of computer science**;
- have an **in-depth knowledge of the scientific method of investigation** and understand and use the tools of discrete and continuous mathematics, applied mathematics and physics, which support computer science and its applications;
- have an in-depth knowledge of the principles, structures and use of **processing systems**;
- have knowledge of the fundamentals, techniques and methods of designing and implementing **computer systems**, both basic and applicative;
- have knowledge of **various application sectors**;
- have elements of **business and professional culture**;
- be able to use fluently, in written and oral form, at least one European Union language in addition to Italian, also with reference to disciplinary lexicons;
- be able to work with great autonomy, also taking on **responsibility for projects and structures**.





# LM Computer Science – specific learning objectives

The specific learning objectives are:

- the deepening of the **scientific and technological aspects of one of the macro-areas of computer science** or the expansion of one's skills in the study of more than one macro-area;
- the completion of one's education through **training activities offered by other courses of study at the University of Trento** (biology, economics, mathematics, etc.) or activities related to entrepreneurship and innovation offered within the educational programs of the European Institute of Innovation and Technology;
- the analysis and creation of **models for complex problems in various application contexts**;
- the design and **development of high-quality computer systems**;
- the **design of systems** in areas related to computer science, in the sectors of research, industry, services, the environment, health, cultural heritage and public administration.

In addition, specific courses and seminars related to **entrepreneurship** will be offered, also with the participation of successful entrepreneurs, in order to promote a fully satisfying insertion into the world of work and the creation of new companies.





## LM Computer Science – training paths

The Computer Science course at the University of Trento offers a **very flexible, personalizable training path (more than 80 courses!)**, which makes it **unique compared to similar courses of other Italian Universities**; the standards and quality of our courses are comparable to the standards of prestigious European and worldwide universities.

A **strong drive toward internationalization** is one of the key factor that distinguishes Computer Science at the University of Trento. The Computer Science course offers the opportunity to enter the **Double Degree Programme in the frame of the EIT Digital and EIT Manufacturing Master Schools**; the student will spend one year in Italy and one year at the Partner University and, at the end the programme, he/she will obtain two Degrees recognized by both institutions and both Countries.

The **connections with the industry is very close** (both with large companies, such as IBM and Microsoft, as well as national and international SMEs).

The educational offer is organized into two curricula, with different specialization areas:

- **Computer Science and Technologies**

Areas: Computational Foundations, Data Science, Bioinformatics, Software and Service Architectures, Systems and Networks, Cybersecurity, Human-Computer Interaction (18CFU in one area + 18CFU in another)

- **ICT Innovation**

Areas: Cyber Security and Privacy, Data Science, Embedded Systems, Finance Technology, Competitive Manufacturing, Human-Computer Interaction and Design



# LM Computer Science – Computer Science and Technologies

- **Mandatory (6CFU)**  
Computability and computational complexity
- **Foundation of Economy, Management and Innovation (6CFU)**  
Choose one between:
  - Ethics for computer science and engineering (6 CFU)
  - Innovation and Business in ICT (6 CFU)
- **Foundation of Computer Science (12CFU)**  
Choose two between:
  - Distributed systems (6 CFU)
  - Machine Learning (6 CFU)
  - Security Testing (6 CFU)

Mandatory/  
fixed choice (30CFU)



Mandatory/fixed-choice (30CFU)

Depth (18CFU)

Breadth (18 CFU)

Free Choice (24CFU)

Internship and Thesis (30CFU)



# LM Computer Science – Computer Science and Technologies

- **Complements of Communication and Electronic Engineering (6CFU)**

- Advanced computing architectures
- Simulation and performance evaluation
- Computer Vision
- Remote Sensing Systems and Image Analysis
- Software and virtualized mobile networks
- Multimedia Data Security

Mandatory/  
fixed choice (30CFU)



Mandatory/fixed-choice (30CFU)

Depth (18CFU)

Breadth (18 CFU)

Free Choice (24CFU)

Internship and Thesis (30CFU)



# LM Computer Science – Computer Science and Technologies

- **Choose one depth area among (18CFU):**
  - Computational Foundations
  - Data Science
  - Bioinformatics
  - Software and Service Architectures
  - Systems and Networks
  - Cybersecurity
  - Human-Computer Interaction

Depending on the area/exam choice:

- 3 exams x 6CFU or 2 exams x 6CFU + 1 exam x 12 CFU

## Depth (18CFU)



Mandatory/fixed-choice (30CFU)

Depth (18CFU)

Breadth (18 CFU)

Free Choice (24CFU)

Internship and Thesis (30CFU)



# LM Computer Science – Computer Science and Technologies

- **Choose one breadth area (different from depth) among (18CFU):**

- Computational Foundations
- Data Science
- Bioinformatics
- Software and Service Architectures
- Systems and Networks
- Cybersecurity
- Human-Computer Interaction

Depending on the area/exam choice:

- 3 exams x 6CFU or 2 exams x 6CFU + 1 exam x 12 CFU

## Breadth (18CFU)



Mandatory/fixed-choice (30CFU)

Depth (18CFU)

Breadth (18 CFU)

Free Choice (24CFU)

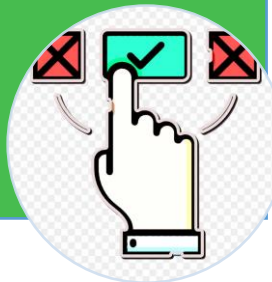
Internship and Thesis (30CFU)



# LM Computer Science – Computer Science and Technologies

- All courses offered by DISI LMs are accepted.
- Courses offered by other Departments from the University of Trento need a justification and are subject to approval.

Free Choice (30CFU)



Mandatory/fixed-choice (30CFU)

Depth (18CFU)

Breadth (18 CFU)

Free Choice (24CFU)

Internship and Thesis (30CFU)



# LM Computer Science – ICT Innovation

## Specialization areas

- **FT** Finance Technology (*also for EIT Digital - entry/exit*)
- **CSE** Cyber Security and Privacy (*also for EIT Digital - entry/exit*)
- **DS** Data Science (*also for EIT Digital - exit*)
- **ES** Embedded Systems (*also for EIT Digital - exit*)
- **HCID** Human Computer Interaction and Design (*also for EIT Digital - exit*)
- **CM** Competitive Manufacturing (*also for EIT Manufacturing - entry/exit*)

## Important notes on EIT

- These areas correspond to **EIT technical programs** which are part of the **EIT Digital Master School**, held in a consortium of European top universities and leads together with business partners to provide on a double-degree program both technical excellence and hands-on experience, and of the **EIT Manufacturing Master School**, a double degree programme aimed at spreading innovation and creating new business in the manufacturing ecosystem.
- EIT programs involve **mandatory 2-year mobility**, the 1st year in an entry and the 2nd one in an exit university. They also include a mandatory Summer School held in one of the EIT nodes in Europe.
- The University of Trento is holding some of these areas either as an **entry and exit point** (CSE, FT, CM) or as an **exit only** (DS, ES, HCID).
- At the end of the program, a **Master's degree will be awarded by both universities involved** in the mobility scheme. Moreover, EIT students will receive an "EIT label" certificate, which aims at attesting the Innovation & Entrepreneurship skills gained during the program.
- More info available on the [EIT Digital Master School page](#) and [EIT Manufacturing Master School page](#).



## 1st year ICT (also for EIT entry)

- 24CFU mandatory (Innovation and Entrepreneurship)
- 24CFU\* mandatory (technical)
- 12CFU\* fixed-choice (technical)\*\*

## 2nd year ICT (also for EIT exit)

- 6CFU\* mandatory (Innovation and Entrepreneurship)
- 24CFU\* fixed-choice (technical)\*\*
- 30CFU internship and thesis

\* The num. of CFU is different for ES and CM.

\*\* 24CFU of fixed-choice can be free-choice upon approval.

## LM Computer Science – employment opportunities

The occupational and professional fields of reference for graduates of the master's degree program in the class are those of the design, organization, management and maintenance of complex or innovative computer systems (with specific regard to the requirements of **reliability**, **performance** and **security**), both in manufacturing companies in the areas of computer systems and networks, and in companies, public administrations and, more generally, in all organizations that use complex computer systems.

The following are exemplified as particularly relevant for employment and professional opportunities:

- **computer systems** for the sectors of industry, services, environment and territory, health, science, culture, cultural heritage and public administration;
- **innovative applications** in the field of image and sound processing, recognition and artificial vision, neural networks, artificial intelligence and soft computing, computational simulation, data security and confidentiality and access to data, computational graphics, user-computer interaction and multimedia systems.





## LM Computer Science – employment opportunities

**ca. 90% graduates  
occupied with a  
job in 1 year from  
graduation**





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## LM Computer Science – enrollment

To be admitted to the Master in Computer Science it is necessary:

- to have a **first-level university degree in Computer Science or any related field**;
- to have a minimum upper-intermediate level of English (**Level B2**).

There is **no longer a limited enrolment for EU citizens**.

Limitations apply only for non-EU (limited no. of grants).

<https://international.unitn.it/ict-mcs/admission-requirements>





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# LM Computer Science – links

## **Master's degree webpage (ENG)**

<https://offertaformativa.unitn.it/en/lm/computer-science/programme>

## **Ordinamento (ITA)**

<https://www.unitn.it/alfresco/download/workspace/SpacesStore/1f564066-e5bc-4a1d-b948-3f85f0cc93d8/informatica-lm18.pdf>

## **Rules, regulations, and manifesti (ENG/ITA)**

<https://offertaformativa.unitn.it/en/lm/computer-science/rules-and-regulations>

