UNIVERSITÀ DI TRENTO

DEPARTMENT OF

INFORMATION ENGINEERING AND COMPUTER SCIENCE

LM Artificial Intelligence Systems

LM Sistemi di Intelligenza Artificiale

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LM Artificial Intelligence Systems – generic learning objectives

Graduates of master's degree programs in this class must:

- Have an in-depth understanding of the **theoretical and scientific aspects of mathematics, basic sciences, and engineering, with particular emphasis on computer engineering**, and **use this knowledge to interpret, describe, and solve complex or interdisciplinary problems**, including in innovative ways.
- Be **capable of designing, planning, developing, and managing complex and/or innovative systems, processes, and services**.
- Be **capable of designing and managing highly complex experiments**.
- Possess **contextual knowledge and transversal skills**.
- Have **knowledge in the field of business organization** (corporate culture) and **professional ethics**.
- Be able to fluently use, in both written and spoken forms, at least one European Union language other than Italian, including its disciplinary lexicon.

LM Artificial Intelligence Systems – specific learning objectives

Master's degree graduates in Artificial Intelligence Systems:

a) are capable of developing and **using innovative methods and tools to address emerging challenges** by **designing, engineering, organizing, and managing complex and innovative systems based on intelligent computer systems**. To achieve this, they acquire a broad set of skills focused on Computer Engineering but extended to interdisciplinary application contexts;
b) possess a solid **theoretical and scientific background in mathematics and information engineering**;
c) are able to **identify connections between ethical principles and legal rules**, as well as **understand the implications of technology use and the impact of their design choices**.

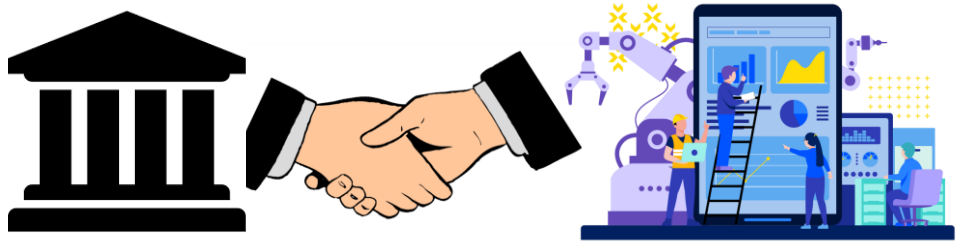
Depending on their chosen training path, they can expand their interdisciplinary skills to achieve one of the following objectives in addition to the ones listed above:

1) further **deepen their theoretical and methodological knowledge** to achieve a high level of **specialization in the design of artificial intelligence-based systems**;
2) acquire advanced knowledge in **various disciplines of information engineering for industrial, environmental, and biomedical applications**;
3) propose **strategies for marketing products, processes, and organizations based on artificial intelligence** that are competitive in terms of efficiency, productivity, and sustainability;
4) integrate **computational, behavioral, and neuroimaging approaches to better understand human behavior** and provide **inspiration for the development of new intelligent systems**.

LM Artificial Intelligence Systems – training paths

- A strong **drive toward internationalization** is one of the key factor that distinguishes Artificial Intelligence Systems at the University of Trento. The 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 Trento 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 national and international companies, as well as national and international SMEs).



LM Artificial Intelligence Systems – training paths

Common activities in the following areas of study:

- **Foundational and applied computer science disciplines of artificial intelligence**, such as knowledge representation, automated reasoning, machine learning, natural language processing, optimization, and human-machine interaction;
- Disciplines related to **industrial and service robotics, operational autonomy of mechatronic devices, and automation** of complex processes;
- Disciplines concerning the **acquisition, processing, and analysis of information** (signals, speech, images, and video), **artificial vision, and their applications**;
- Disciplines in the **legal domain**, with a particular focus on the **basic legal frameworks relevant to the design and application of artificial intelligence systems**.

Multiple tracks:

1) Further **deepening mathematical and/or computer science disciplines foundational and applied to artificial intelligence, as well as those related to robotics**.
2) Provide **advanced training in information engineering** disciplines for the design and **use of artificial intelligence systems in various application contexts**.
3) Introduces disciplines in the **economic and managerial fields, focusing on the organization, management, and innovation of decision-making and production systems based on artificial intelligence**.
4) Disciplines in **cognitive neuroscience, language, and their applications to artificial intelligence models**.

Mandatory (42CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- Fundamentals of AI (12 CFU) - DISI
- Machine Learning (12 CFU) - DISI
- Natural Language Understanding (6 CFU) - DISI
- AI & Ethics (6 CFU) – JUS
- One course among
  - Signal, Image & Video (6 CFU) - DISI
  - Artificial and Biological Neural systems (6 CFU) – CIMEC

Mandatory (42 CFU)

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In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- Automated Planning Theory and Practice (6 CFU) – DISI
- Automated Reasoning (6 CFU) – DISI
- Bio-Inspired AI (6 CFU) – DISI
- Human-Machine Dialogue (6 CFU) – DISI
- Introduction to Robotics (6 CFU) – DII
- Autonomous Software Agents (6 CFU) – DISI
- Signal, Image & Video (6 CFU) - DISI
- Artificial and Biological Neural systems (6 CFU) – CIMEC

In-Depth (18 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- **Intelligent Robots**
  - Distributed Robot Perception (6 CFU) – DII
  - Optimisation and Learning for Robot Control (6 CFU) – DII
  - Robot Planning and its Applications (6 CFU) – DISI

Specialization - **Methodologies and Applications** (18 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- **Computer Vision**
  - Computer Vision (6 CFU) -- DISI
  - Advanced Computer Vision (6 CFU) -- DISI
  - Trends and Applications in Computer Vision (6 CFU) -- DISI

Specialization - **Methodologies and Applications** (18 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- **Methodologies**
  - Advanced Topics in Machine Learning and Optimisation (6 CFU) -- DISI
  - Foundation Model (6 CFU) -- DISI
  - *One more course taken from In-Depth*

Specialization - **Methodologies and Applications** (18 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- **Humans and AI**
  - Foundation Models (6 CFU) -- DISI
  - Knowledge Graphs (6 CFU) -- DISI
  - *One course course among*
    - Studies on human behavior (6 CFU) – DISI
    - Human centric AI (6 CFU) – DISI
    - Advanced HCI (6 CFU) -- DISI

Specialization - **Methodologies and Applications** (18 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- Business Development labs (6 CFU) -- DISI
- AI and Innovation (6 CFU) -- DISI
- Innovation and Entrepreneurship basics (6 CFU)-- DISI

Specialization – **AI and Innovation** (18 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- Software development for collaborative robots (6 CFU) - DISI
- AI for food and quality control (6 CFU) - DE
- Sensing and Radar Technologies (6 CFU) - DISI

Specialization – **AI Systems and sustainability** (18 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- Foundations of Cognitive Psychology and Neuroscience (6 CFU) – CIMEC
- Foundation Models (6 CFU) - DISI
- Semantics and Cognition (6 CFU) – DISI
- Introduction to Human Language (6 CFU) – CIMEC
- Language and Social Cognition (6 CFU) – CIMEC
- One course among depth courses (6CFU) - DISI

Specialization – **Neuro-Cognitive architectures** (36 CFU)

Mandatory (42 CFU)

In-Depth (6 CFU)

Specialization (32 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – training paths

- All courses offered by DISI accepted with no problems
- Courses offered by other departments needs a justification and are subject to approval by the CdS delegate for training paths

Free Choice (12 CFU)

Mandatory (42 CFU)

In-Depth (18 CFU)

Specialization (18 CFU)

Free Choice (12 CFU)

Internship and Thesis (30 CFU)

LM Artificial Intelligence Systems – employment opportunities

The typical career opportunities for an Artificial Intelligence specialist include roles in both **corporate operational** sectors and **research and development centers**, particularly in:

- companies involved in the design, development, engineering, production, and operation of **intelligent solutions and systems and their applications**;
- manufacturing companies, agrifood businesses, civil-sector organizations, public administration sectors, and **service companies utilizing AI-based computer systems**;
- companies focused on the **acquisition, processing, analysis, and transmission of information** (data, voice, images, and video);
- industries specializing in **automation and robotics**, as well as manufacturing companies using systems and equipment for **process automation**;
- companies working in the design and development of embedded systems and digital platforms for **autonomous and intelligent systems**;
- companies across diverse sectors requiring expertise for the development and use of **AI-based systems to support internal organization, production, and marketing**;
- advanced service and tertiary companies operating particularly in the design, provision, and maintenance of services delivered via telematic networks, the internet, and the web;
- companies producing and/or utilizing IT components and systems;
- companies providing infrastructure and services for IT systems and networks;
- software engineering firms;
- **public and private research and development centers**;
- **postgraduate studies and second-level university master's programs**.

LM Artificial Intelligence Systems – employment opportunities

100% graduates occupied with a job in 1 year from graduation

Updated at 20/10/2025, ANVUR

LM Artificial Intelligence Systems – enrollment

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

- A **Bachelor Degree with a "reasonable" background in Computer Science Engineering** (at least 12 CFU)
- 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 (5 grants)

https://corsi.unitn.it/en/artificial-intelligence-systems

Useful links

Master's degree webpage (ENG)
https://corsi.unitn.it/en/artificial-intelligence-systems

Ordinamento (ITA)
Ordinamento

Rules, regulations, and manifesti (ENG/ITA)
https://corsi.unitn.it/en/artificial-intelligence-systems/study/program-guide-and-documents

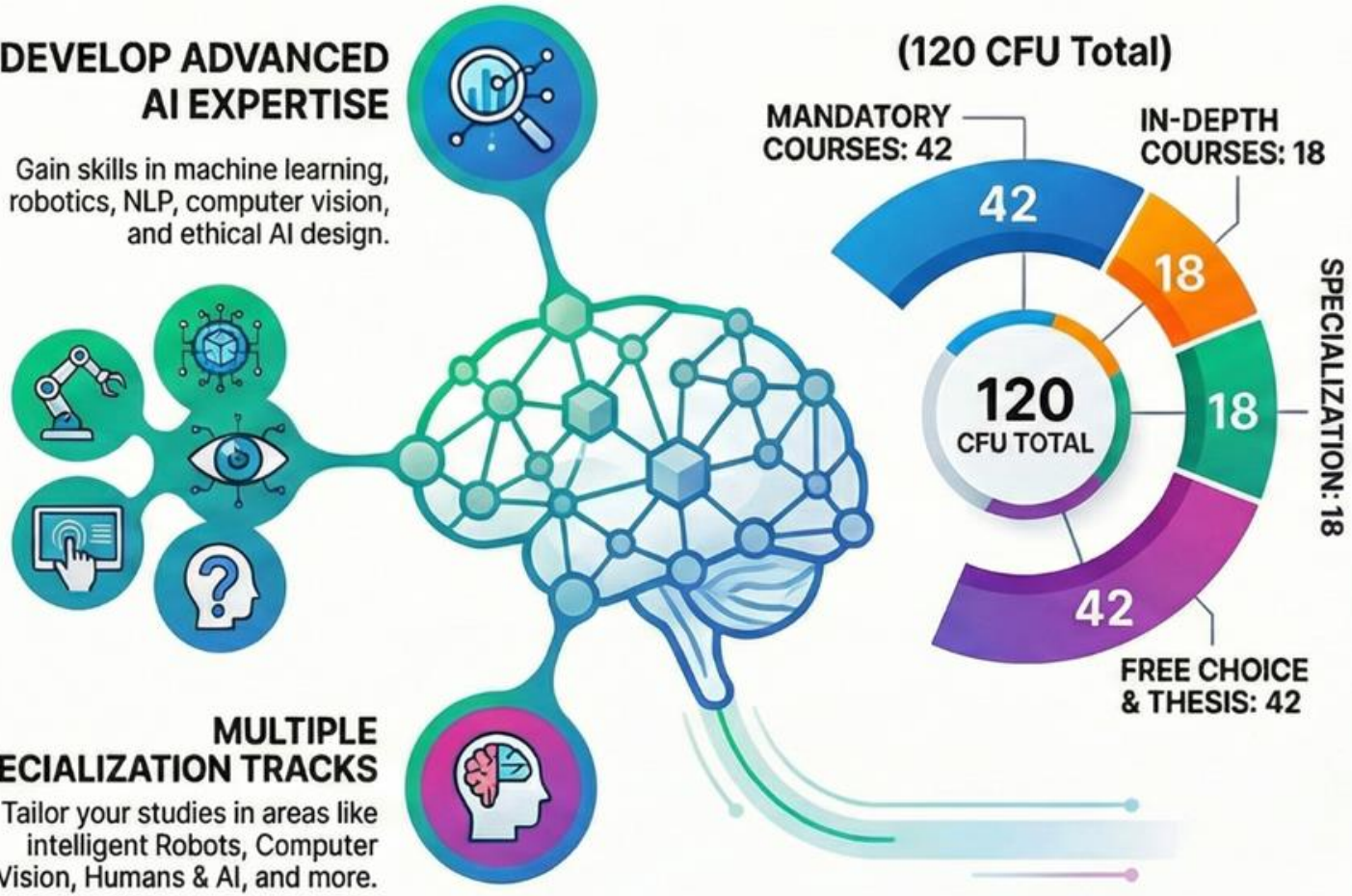
EIT Digital and Manufacturing (ENG/ITA)
https://www.disi.unitn.it/eit-digital
https://www.disi.unitn.it/eit-manufacturing

Master of Science: Artificial Intelligence Systems - University of Trento

PROGRAM STRUCTURE & CORE SKILLS

DEVELOP ADVANCED AI EXPERTISE

Gain skills in machine learning, robotics, NLP, computer vision, and ethical AI design.



(120 CFU Total)

MULTIPLE SPECIALIZATION TRACKS

Tailor your studies in areas like intelligent Robots, Computer Vision, Humans & AI, and more.

GLOBAL OPPORTUNITIES & CAREER OUTCOMES

STRONG INDUSTRY & INTERNATIONAL CONNECTIONS

Benefit from close ties to companies and options for Double Degree programs.

100% EMPLOYMENT RATE

All graduates find a job within one year of graduation.

DIVERSE CAREER PATHS