Master degree in Computer Science
Studying Computer Science is an excellent choice ...

Information technology and the digitization of all economic sectors are a fundamental lever for innovation and the transformation of society.

“At the heart of our work is the need to tackle the climate, technological and demographic changes that are transforming our societies and our way of life... The EU must lead the transition to a healthy planet and a new digital world .. ."

_Ursula von der Leyen_, President of the European Commission
Studying Computer Science at the Computer Science Department of UNIMI

Research excellence in the main disciplinary areas of IT

Master Degree Computer Science courses linked to the most innovative research activities of our department
Studying Computer Science at the Computer Science Department of UNIMI

- Research excellence in the main disciplinary areas of IT
- Master Degree Computer Science courses linked to the most innovative research activities of our department
- Collaborations with research centers and universities in Europe and all around the world
- Students involved in collaborations with research centers and cutting-edge companies in the IT, industrial, advanced tertiary sector, Healthcare
Studying Computer Science at the Computer Science Department of UNIMI

Research excellence in the main disciplinary areas of IT

Didattica Laurea Magistrale Informatica legata alle attività di ricerca più innovative del nostro dipartimento

Collaborations with research centers and universities in Europe and all around the world

Students involved in collaborations with research centers and cutting-edge companies in the IT, industrial, advanced tertiary sector, Healthcare

We are among the largest Italian CS dept. and we provide over 70 courses for the Master degree in Computer Science

Possibility of work and research experiences in the numerous laboratories of the department
Laboratories at DI

EveryWare Lab
Data Management for Mobile and Pervasive Computing

IEBI Lab
Industrial, Environmental and Biometric Informatics Laboratory

SPDP Lab
Security, Privacy, and Data Protection

MIPS Lab
Multimedia, Interaction, Perception, Society

INTERNET OF PEOPLE, THINGS AND COMPUTERS
Network Protocols and Technologies Lab – NPTLab

POMS
Playlab for Innovation in Games

SESAR LAB
SEcure Service-oriented Architectures Research Lab

PHUSE Lab
Perceptual computing and HUman SEnsing
Course objectives

- Solid cultural background and skills in the various IT sectors:
  - acquire the fundamental knowledge and skills to “adapt” to the rapid evolution of Computer Science and Information Technologies
  - Knowing how to apply computer skills in the various sectors of the economy and society
- Ability to incorporate innovations and propose new developments
- High-level analytical and operational skills
- Open and critical view of the problems associated with information technology
Knowledge and skills

- Algorithms, languages, logical and formal methods
- Software development and design
- Information systems and data management
- Architectures and networks
- Artificial Intelligence and Machine Learning
- Data analysis and optimization
- Processing of signals, images, videos
- Multimedia and social communication
Free and guided programme

Courses are free choice with the constraint of choosing between the 4 sets of courses - see Programme description https://apps.unimi.it/files/manifesti/eng_manifesto_F94of2_2023.pdf:

- Characterizing courses (18 CFU among 10 courses + 3 CFU English language)
- Courses from Table 1 (30/36 CFU between 45 courses)
- Courses from Table 2 (12/18 CFU between 22 courses)
- Other courses provided at UNIMI (12 CFU)
- Final exam: 39 CFU

To help the choice, two types of training courses:

- Free programme
- 10 predefined guided programmes
Study programme: general and methodological courses:

- English language (B2 level) 3

Characterizing courses: 18 CFU among the following 10 courses
- Artificial intelligence 6
- Natural interaction 6
- Advanced Programming 6
- Software development in complex teams
- Multimedia Architectures
- Theoretical Computer Science
- Information management
- Wireless and mobile networks
- Distributed and pervasive systems
- Statistical methods for machine learning 6+6+6
Study programme

Two typologies

Free programme

Guided programme

• Freely chosen by the student and modifiable from year to year
Guided study programmes

- Algorithms and fundamentals
- Analytics and optimization
- Artificial Intelligence
- Industry and Business Informatics
- Music Information Science
- Methods and models for sw design and development
- Mobility and pervasive computing
- Perceptual computing
- Predictive modeling and Data Science
- Video Game
Algorithms and fundamentals

Deepen your cultural background on the theoretical and algorithmic aspects of computer science and develop your knowledge in one of the corresponding specialist sectors.

General and methodological courses

- Theoretical computer science
- Theory of languages
- Algorithms and complexity
- Probabilistic methods for computer science
- Mathematical logic
- Advanced programming
- Distributed and pervasive systems

SECTOR "ALGORITHMs"
- Web algorithmics
- Heuristic algorithms
- GPU-Computing

SECTOR "MACHINE LEARNING"
- Bioinformatics
- Statistical methods for machine learning
- Artificial vision

SECTOR "OPERATION RESEARCH"
- Probabilistics methods for Informatics
- Operation Research Complements
- Combinatorial Optimization

SECTOR "FORMAL METHODS"
- Formal Methods
- Software verification and validation
- Software development in complex teams
Knowledge and skills on decision support methods based on the use of digital data, mathematical models (descriptive, predictive and prescriptive) and on optimization algorithms.

Characterizing courses:
- Heuristic algorithms
- Simulation
- Algorithms for massive datasets
- Intelligent systems for industry, supply chain and environment
- Business process engineering

Fundamental courses:
- Artificial intelligence
- Information management
- Statistical methods for machine learning
Theoretical and methodological foundations of artificial intelligence, courses aimed at developing application skills in some of the main sectors focusing on scientific, methodological and technological aspects.

Modelling, management and processing of data and knowledge:

- Natural interaction
- Intelligent systems for industry, supply chain and environment
- Algorithms for massive datasets
- Information retrieval
- Biomedical signal processing
- Bioinformatics
- Audio pattern recognition
- Affective computing
- Privacy and data protection

General and methodological courses:

- Artificial Intelligence
- Information management
- Statistical methods for Machine Learning
Industry and Business Informatics (in english)

Modeling the processes and information about activities of organizations and people, and making operational decisions that allow to manage complex systems:

- **Analysis and management of business processes**, both management ones of the company, both manufacturing and logistics
- **Management of the territory and public administrations** (eg: PA, Health), environmental monitoring and management of services.
- Social interaction analysis and **data analysis in social networks**
- Integrate information through **Internet of Things**-based structures, **cloud systems, cyberinformatics systems, embedded and mobile systems**.

General and methodological courses

- Artificial Intelligence
- Information management
- Natural interaction

Modelling, management and processing of data and knowledge:

- Business process engineering
- Methods for image processing
- Intelligent systems for industry, supply chain and environment
- Simulation
- Algorithms for massive datasets
- Audio Pattern Recognition
- Biomedical signal processing
- Information retrieval
Music Information Science

The Music Information Science programme aims to provide a solid background and a thorough knowledge of multidisciplinary methods and technologies of sound investigation and music computing.

Leveraging on the Bachelor's Degree Programme in Music Information Science, it focuses on the most advanced theoretical and applicative aspects of information technology in the musical field.

General and methodological courses
- Multimedia Architectures
- Artificial Intelligence
- Information Management
- Natural Intraction
- Statistical Methods for Machine Learning
- Advanced programming
- Distributed and pervasive systems

Fundamental courses
- Audio Pattern Recognition
- MIDI programming
- Programming for Music
- DSP Architectures and programming
- Multimedia techa organization and Digitization
- Sound in Interaction
Methods and models for sw design and development

Reliable and high quality software development, through languages, methods and models connected with various aspects of software production in general (from the management and organization of the production process to analysis, design, development and maintenance, with particular regard to verification and validation) and in specific areas such as the design and development of video games or apps for mobile computing.

General and methodological courses

- Theoretical Computer Science
- Mathematical Logic

Fundamental courses

- Software development in complex teams
- Advanced programming
- Distributed and pervasive systems

Characterizing courses:

- 3D video games
- Sicurezza informatica
- Statistical methods for machine learning
- Tecniche speciali di programmazione
- Teoria dei linguaggi
- Software verification and validation
- Web algorithmics
Mobility and pervasive computing

Integration and processing of context data obtained from sensors on board mobile devices or integrated into the environment and objects of daily use (IoT).
Georeferenced and context-aware services for personal, social and professional use; sensors of environmental factors.
Management of large amounts of personal data, with advanced data security techniques.
Perceptual computing for the interaction between human beings and the environment in which they are immersed to operate. Analysis techniques of classical signals (audio, images, video, proximity, etc.) and behavioral/emotional signals used by human beings, for non-verbal communication: postures, facial expressions, gestures, physiological reactions.

Characterizing fundamental courses:
- Artificial intelligence
- Natural interaction
- Statistical methods for machine learning

Characterizing and integrative courses:
- Audio Pattern Recognition
- Artificial vision
- Real time graphics programming
- Probabilistic methods for Informatics
- GPU Computing
- Affective Computing
- Biomedical signal processing
Predictive modeling and Data Science

Organization of the acquisition of different types of data (texts, images, relationships, genes, ...) structured in different ways (flows, hierarchies, networks, ...) and coming from various sources (Web, sensors, terminals mobile, ...), also taking into account problems related to the size of the data available and their structuring in appropriate databases. Analysis of these data by combining statistical, algorithmic and machine learning techniques in order to synthesize predictive models.

Characterizing and integrative courses:
- Web algorithmics
- Bioinformatics
- Algorithms for massive datasets
- Architectures for big data
- Privacy and data protection
- GPU computing
- Simulation
- Decision methods and models
- Information retrieval

General and methodological courses:
- Artificial Intelligence
- Statistical methods for machine learning
- Information Management
Video Game

Provide the conceptual, methodological, design and application tools necessary for the design and programming of videogame SW

General and methodological courses:
- Distributed and pervasive systems
- Software development in complex teams
- Advanced Intelligent Systems
- Statistical methods for machine learning
- Advanced programming

Design of videogames:
- Game and level design
- Game design
- Artificial intelligence for video games
- Online game design
- Real-time Graphics Programming
- Video game design and programming

Architecture and programming of videogames:
- Multimedia Architectures
- GPU computing
- Design of Sensor Systems
- Communication protocols for mobile, ad hoc and wireless sensor networks
- Security
- Wireless and mobile networks
- Advanced programming techniques
Possibility of studying abroad

- **Erasmus +:**
  - over 50 UE Universities.
  - 5 months abroad on the average
  - course for about 30 CFU

- Other possibilities / grants for periods of study or thesis abroad
Good news for students of the Master's Degree in Computer Science at UNIMI:
full employment of master's degree graduates

Statistics on the employment opportunities of master's degree graduates in IT confirm the growing weight of IT in the "knowledge society" ...
Employment rate for Master degree CS graduates

Source: AlmaLaurea
https://www.almalaurea.it

- Employed: 61.9%
- PhD/master: 28.6%
- Total: 90.5%

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Source: AlmaLaurea
https://www.almalaurea.it
Average entry time into the labor market for Master Degree CS graduates

For current graduates, employment is practically immediate 😊

Source: AlmaLaurea
https://www.almalaurea.it
Contacts for information and help

- President of the Academic Board:
  Giovanni Pighizzini  giovanni.pighizzini@unimi.it

- Coordinator of the Master degree in CS:
  Giorgio Valentini  valentini@di.unimi.it

- Course quality contact person:
  Marco Tarini  macro.tarini@unimi.it

- Guidance tutors:
  Roberto Cordone  roberto.cordone@unimi.it
  Giuliano Grossi  giuliano.grossi@unimi.it
  Mattia Monga  mattia.monga@unimi.it
  Beatrice Palano  palano@di.unimi.it
  Laura Ripamonti  ripamonti@di.unimi.it
Master degree in CS: more information on the web

- UNIMI site of the Master degree in CS:
  https://informatica-lm.cdl.unimi.it/en

- Course presentation:
  https://informatica-lm.cdl.unimi.it/en/programme

- Study programmes:
  https://informatica-lm.cdl.unimi.it/en/programme/suggested-study-programmes

- Guidance site:
  http://orientamento.di.unimi.it/

- International students office:
  https://www.unimi.it/en/international/coming-abroad/international-students-office-welcome-desk
Useful contacts

Admission to Master Degree Commission
Email: ammissioni.magistrali@di.unimi.it

Orientation at the entrance Commission
Email: orientamento@di.unimi.it

Orientation after the degree Commission
Email: orientamento.uscita@di.unimi.it

Study planning and programme Commission
http://www.di.unimi.it/ecm/home/organizzazione/organi-di-governo/altre-commissioni

Erasmus and International Students Commission
Email: erasmus@di.unimi.it

Master Degree thesis Commission
Email: tesi.magistrali@di.unimi.it

Transfer Commission
Email: trasferimenti@di.unimi.it

Students representatives
Email: rappresentantistudenti@di.unimi.it
We look forward to seeing you in our new department ...

• An updated teaching linked to the great research tradition of the Department of Computer Science

• State-of-the-art classrooms and laboratories and a large teaching staff capable of covering all the main areas of IT

• A dynamic environment: studying and working in collaboration with the research teams of the department also in the context of international collaborations

• Secure employment opportunities in all areas of information technology applied to industry, services, the advanced tertiary sector

• Possibility to continue your studies with a PhD in Computer Science