UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2026/27
BACHELOR
COMPUTER SCIENCE (Classe L-31 R)
Enrolled in 2026/27

HEADING

Degree classification - Denomination and code:	L-31 R
Degree title:	Dottore
Length of course:	3 years
Total number of credits required to complete programme:	180
Years of course currently available:	1st
Access procedures:	Cap on student, student selection based on entrance test
Course code:	FAA

PERSONS/ROLES

Head of Study Programme
Prof.ssa Sabrina Gaito

Degree Course Coordinator
Prof. Paolo Boldi

Tutors - Faculty
TUTOR PER L'ORIENTAMENTO:
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Massimo Santini
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Andrea Visconti

Degree Course website
https://informatica.cdl.unimi.it/

Via Celoria 18 - 20133 Milano https://di.unimi.it/it/dipartimento/organizzazione/commissioni Email: orientamento.uscita@di.unimi.it
Via Celoria 18 - 20133 Milano https://di.unimi.it/it/dipartimento/organizzazione/commissioni Email: orientamento@di.unimi.it
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https://di.unimi.it/it/dipartimento/segreterie-e-servizi/ufficio-la-didattica https://informastudenti.unimi.it/saw/ess?AUTH=SAML

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

The Bachelor's Degree in Computer Science aims to provide a broad-spectrum education in the main areas of computer science, focusing on fundamental methodological aspects while also covering necessary applied knowledge. Furthermore, the program seeks to offer up-to-date knowledge of the discipline, avoiding excessive reliance on technological details and instead concentrating on the principles and methods of both established and emerging technologies. The degree program includes a common core of educational activities to ensure consistency and cultural coherence in training, as well as elective courses that allow students to explore specific areas of interest within the curriculum.

Specifically, the common core courses cover fundamental mathematics, theoretical foundations of computer science,

programming and software development techniques, and essential knowledge of computer architectures and systems (including networks) and hardware. To achieve these educational goals, the program includes lectures, practical exercises, and laboratory courses.

Expected learning outcomes

Knowledge and Understanding

Students will acquire foundational and contextual theoretical knowledge, as well as understanding of applied aspects related to the development of computer systems:

- Mathematical knowledge, including discrete mathematics, continuous mathematics, probability theory, and statistics.
- Core computer science knowledge, such as algorithms, data structures, and computational complexity.
- Programming knowledge, including procedural and object-oriented programming languages.
- Knowledge of computer architectures and systems, including computer architectures, operating systems, computer networks, and databases.
- Understanding of the scientific research method and its ethical implications.
- Awareness of the economic, legal, ethical, social, and environmental implications of digital transformation.
- Theoretical and methodological knowledge related to applied fields of computer science, such as data analysis, quantum computing, artificial intelligence, security and privacy, and multimedia data processing.

Assessment Methods: The acquisition of these knowledge and skills is assessed at the end of each course and throughout the entire study program. Evaluation of individual learning is based on a combination of factors related to the acquisition of methodological and technological knowledge in the field of computer science and its applications.

Applying Knowledge and Understanding

Students are expected to develop methodological, technological, and practical skills in the field of computer science and its applications:

- Ability to apply the scientific research method.
- Capability to analyze and model problems using foundational and contextual knowledge related to computer system development in various industries.
- Proficiency in analyzing and modeling systems of varying complexity (from small-scale problem-solving to large-scale system development).
- Ability to design, develop, and validate applications in various industries and scientific domains.
- Capability to develop applications requiring knowledge of hardware aspects, including signal transmission and processing.
- Proficiency in using different operating systems, configuring network environments, and employing database management tools.

Assessment Methods: These skills are evaluated at the end of courses and throughout the program, based on individual assessments testing methodological and technological competencies in computer science and its applications.

Making Judgments

Students will develop independent judgment skills to take autonomous decisions regarding the analysis, design, development, implementation, evaluation, and management of computer applications across different scales and domains, both of scientific and industrial type. Specifically, they will be able to:

- Anticipate and manage the economic, legal, ethical, social, and environmental sustainability implications of their professional activities and digital transformation.
- Operate autonomously by applying their knowledge to real-world scientific, professional, industrial, and institutional contexts.
- Develop independent reasoning and reflections.
- Critically evaluate alternative design and implementation choices.
- Conduct independent research work.
- Evaluate and interpret objective and subjective experimental data.

Assessment Methods: These skills are assessed through individual evaluations at the end of courses and throughout the program, based on a combination of methodological and technological testing about computer science and its applications.

Communication Skills

Students will develop strong communication skills, particularly in the following areas:

- Effectively communicating with users and experts in relevant application domains, working in interdisciplinary teams using appropriate technical and scientific language and communication methods.
- Developing interpersonal and decision-making skills, and working effectively both as team leaders and as team members.
- Communicating effectively in written and oral form, using appropriate terminology in scientific disciplines and various applied fields of computer science and engineering.
- Promoting and managing digital transformation processes.

Assessment Methods: These skills are evaluated through written and oral assessments at the end of courses and throughout the program.

Learning Skills

Students will acquire the ability to learn autonomously, particularly in the following areas:

- Continuously developing and deepening both theoretical and applied competencies to keep oneselves updated with

methodological advancements and digital technologies in computer science.
- Using libraries, databases, archives, and electronic repositories to access relevant scientific and documentary information for ongoing knowledge updates.
Assessment Methods: These skills are evaluated at the end of courses and throughout the program, especially through in-depth methodological and technological studies.

Professional profile and employment opportunities

IT Technology Expert with Analysis, Design, and Implementation Skills
Role in a Work Context:
The Bachelor's Degree in Computer Science aims to train graduates for immediate entry into the job market as professionals capable of performing technical and operational tasks in consulting, analysis, design, management, maintenance, and marketing of small- and large-scale IT systems. Graduates will be able to work in various application areas, designing and managing IT and telecommunication systems and developing new systems and applications.
Associated Competencies:
The program provides knowledge of methods and techniques for the development of IT and telecommunication systems and applications, along with a foundational cultural background that enables graduates to adapt to the ongoing evolution of the field. The acquired competencies cover various areas of computer science and telecommunications, focusing on designing, developing, and managing IT systems and networks across a wide range of application domains. These competencies include:
- Familiarity with the scientific research method.
- Understanding and application of mathematical tools supporting computer science skills.
- Proficiency in English, in addition to Italian, within their field of expertise for professional communication.
- Ability to work both independently and collaboratively, integrating into and contributing to any work environment.

Professional profiles
Graduates in Computer Science can pursue careers in the design, organization, management, and maintenance of IT systems, both in companies producing IT and network systems and in enterprises, public administrations, and organizations utilizing IT systems.
Key industry segments include:
- Banking and insurance
- Logistics and transportation
- Healthcare
- Public administration
- Telecommunications and media
- Service companies
- Industrial sector

Initial knowledge required

Requirements and knowledge required for admission

To be admitted to the Degree Course, candidates must have a secondary school diploma or another qualification obtained abroad, recognized as suitable, as well as having adequate initial preparation. In particular, knowledge of basic scientific disciplines and understanding of elementary logic with a level of depth equal to that deriving from secondary school preparation are required.

Methods of verification of knowledge and personal preparation

The methods of access are established by the Admission Notice published on the page: https://informatica.cdl.unimi.it/it/iscriversi.
The course has a limited number of places in order to guarantee the quality of the educational offer in relation to the available resources and requires a TOLC (CISIA Online Test) as a test for admission. For enrollment in the first year, 250 places are available, of which 10 are reserved for non-EU students not residing in Italy. The TOLC can be taken at the University of Milan or any other university belonging to CISIA (Interuniversity Consortium for Integrated Access Systems). Registration for the TOLC must be done on the CISIA website (https://www.cisiaonline.it/).
The TOLC valid for registration is the TOLC-S, composed of the following sections: Basic mathematics (20 questions - 50 minutes), Reasoning, problems and text comprehension (15 questions - 30 minutes). Score: +1 for each correct answer, -0.25 for each incorrect answer, 0 for each unanswered question. The TOLC contains some additional sections (Biology, Chemistry, Physics, Geology, English). The results of these sections do not contribute to the test score.
After taking the TOLC-S, students must register for the selection for admission to the Degree Course, as indicated in the announcement. They will then be included in the merit ranking that will be formulated on the basis of the score obtained in the test, weighted, for each section, according to the criteria indicated in the announcement. The winners will be able to enroll within the established deadlines.
The selection is divided into distinct periods starting in February and ending in the first days of September.
Enrolled students who have not achieved a score greater than or equal to 10 in the Basic Mathematics module of the TOLC will be assigned Additional Training Obligations (OFA).

Additional training obligations and OFA recovery methods

For students with OFA, support activities will be organized in the period October-December, followed by a recovery test with which the student will have to demonstrate that he/she has improved his/her preparation. In the absence of this evidence, the student will not be able to take any second-year exams before passing the Mathematics I exam. Information: https://informatica.cdl.unimi.it/it/studiare/le-matricole

Transfers and second degrees

Students already enrolled in a degree course at the University of Milan, at another University or already graduated, can be exempted from the test only if they meet the following requirements to be verified during the pre-evaluation of their career:
- if the student, during the pre-evaluation phase, is recognized at least 30 credits, he/she is admitted to the second year or third year with exemption from the test;
- if the student is recognized less than 30 credits, he/she must register for the test and selection as indicated above.
To access the pre-evaluation, a specific request for preventive evaluation of the career must be submitted by accessing the online service indicated in the admission notice. Those interested must declare all the exams taken with the relative sectors, credits and grades and attach the course programs. For further details on the procedure, please refer to the announcement. The request for career evaluation must be submitted without fail by the date indicated in the announcement. The outcome of the evaluation will be communicated via email by the date indicated in the announcement.
Students admitted to years subsequent to the first must enroll by the deadlines and in the manner specified in the announcement.

Part-time enrollment

Part-time enrollment is also possible. The relevant Regulations can be found at the following link https://www.unimi.it/it/ateneo/normative/regolamenti/regolamento-le-iscrizioni-tempo-parziale

Compulsory attendance

Attendance is strongly recommended for both courses and laboratories.

Internship criteria

The internship is mandatory, is linked to the final paper and can be carried out on or off campus (at a company or another organization).
The internship experience normally consists of participating in a significant project, within which the student will independently carry out the activities assigned to him/her in accordance with the number of credits awarded for the internship under that programme (see "Manifesto degli studi").
The final paper must document the design and implementation aspects of the activity carried out, the professional or scientific skills learned, as well as its connections with the state of the art in the IT sector.
The internship must last at least 14 weeks (of which 2 for writing the paper).
Upon completion of the internship, the student will earn 15 CFU, subject to the positive opinion of the Academic Board.
For the student to start the internship, he/she must comply with all the provisions of the relevant regulations.
Find out how to apply for an internship, read internship regulations and more at https://informatica.cdl.unimi.it/it/studiare/stage-e-tirocini

Degree programme final exams

The degree is obtained by passing a final exam, which consists of the presentation of a final report prepared by the student and related to the internship activity carried out. It must concern a theoretical or experimental activity carried out by the student, independently although under the guidance of one or more supervisors, at research laboratories, institutions or companies.

Campus

IT course venues: via Celoria 18 - Milan.
Other course venues: Teaching sector, via Celoria 20; Teaching sector, via Golgi 19; Teaching sector, via Venezian 15.

Laboratories

Computer laboratory (Silab) at the Department of Computer Science, via Celoria 18, Milan.

Notes

In order to obtain their degree, students must be proficient in English at a B1 level under the Common European Framework of Reference for Languages (CEFR). This proficiency level may be certified as follows:
- By submitting a language certificate attesting B1 or higher level in English and issued no more than three years before the date of submission. You will find the list of language certificates recognized by the University at: https://www.unimi.it/en/node/39322. The certificate must be uploaded during the enrolment procedure, or subsequently to the portal http://studente.unimi.it/uploadCertificazioniLingue;
- By taking a placement test offered by the University Language Centre (SLAM) between October and December of the first year. Students who fail the test will be required to take a SLAM course.

The placement test is mandatory for all those who do not hold a valid certificate.
Those who have not taken the placement test by the end of December or fail the end-of-course exam six times must obtain the necessary certification privately before graduating.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.

The agreements entered into by the University with over 300 universities from the 27 EU member countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organisations.

Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

The University of Milan is a member of the 4EU+ European University Alliance that brings together eight public multidisciplinary universities: University of Milan, Charles University of Prague, Heidelberg University, Paris-Panthéon-Assas University, Sorbonne University of Paris, University of Copenhagen, University of Geneva, and University of Warsaw. The 4EU+ Alliance offers integrated educational pathways and programmes to promote the international mobility of students (physical, blended and virtual).

Study and internships abroad

The education program can be enriched by educational activities abroad both to deepen some topics and as socialization experience in international environments. Within the Erasmus+ program study periods can be taken in over 50 universities in Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Lithuania, Norway, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Switzerland, Turkey. Courses will be recognized in the personalized study plan. These periods abroad are typically 5-month long and include courses for about 30 CFU, in the area of information and communication technology and related applications. Recognition of these educational activities will be based on the Learning Agreement, to be defined in advance by the student and the Erasmus coordinator at the Computer Science Department before starting the period abroad: course in the learning agreement with passed exams will replace the educational activities of the study plan ("manifesto"), either by covering the same topics or complementing the acquired basic competences. The Erasmus Committee at the Computer Science Department will perform the recognition of CFU obtained abroad and the definition of the personalized study plan. Similarly, stages to prepare the final dissertation are allowed in the same foreign universities. Recognition will be performed by the Department Erasmus Committee.
Erasmus: the coordinator for the Department of Informatics is Prof. Fabio Scotti.
International Programs: the coordinator for the Department of Informatics is Prof. Davide Rocchesso.
More information are available at the following link: https://di.unimi.it/en/international-relations/international-mobility/international-opportunities

How to participate in Erasmus mobility programs

How to participate in Erasmus+ mobility programmes

The students of the University of Milan can participate in mobility programmes, through a public selection procedure.
Ad hoc commissions will evaluate:
• Academic career
• the candidate's proposed study programme abroad
• his/her foreign language proficiency
• the reasons behind his/her application

Call for applications and informative meetings
The public selection for Erasmus+ mobility for study generally begins around February each year with the publication of a call for applications specifying destinations and requirements. Regarding the Erasmus+ Mobility for Traineeship, the University of Milan usually publishes two calls a year enabling students to choose a destination defined by an inter-institutional agreement or to find a traineeship position on their own.

The University organises informative meetings to illustrate mobility opportunities and rules for participation.

Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which may be supplemented by the University funding for disadvantaged students.

Language courses
Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM).

https://www.unimi.it/en/node/8/

Learn more at https://www.unimi.it/en/node/274/

For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
Contacts: InformaStudenti;
Student Desk booking through InformaStudenti

1st COURSE YEAR Core/compulsory courses/activities common

Learning activity	Ects	Sector
AUTOMATA AND FORMAL LANGUAGES	6	INFO-01/A
COMPUTER ARCHITECTURE I	6	INFO-01/A
COMPUTER ARCHITECTURE II	6	INFO-01/A
COMPUTER PROGRAMMING I	12	INFO-01/A
English assessment B1 (3 ECTS)	3	NN
MATHEMATICAL LOGIC	6	INFO-01/A
MATHEMATICS I	9	(5) MATH-03/A, (4) MATH-02/B
MATHEMATICS II	9	(4) MATH-03/A, (5) MATH-02/B
Total compulsory credits	57	

2nd COURSE YEAR (available as of academic year 2027/28) Core/compulsory courses/activities common

Learning activity	Ects	Sector
ALGORITHMS AND DATA STRUCTURES	12	INFO-01/A
COMPUTER PROGRAMMING II	6	INFO-01/A
DATABASES	12	INFO-01/A
OPERATING SYSTEMS	12	INFO-01/A
STATISTICS AND DATA ANALYSIS	6	INFO-01/A
Total compulsory credits	48	

3rd COURSE YEAR (available as of academic year 2028/29) Core/compulsory courses/activities common

Learning activity	Ects	Sector
COMPUTER NETWORKS	12	INFO-01/A
SOFTWARE ENGINEERING	12	INFO-01/A
Total compulsory credits	24	

Further elective courses

The student must choose 18 ECTS credits from the guided elective courses starting from the second year, selecting courses included within a single track (the courses will be activated starting from the academic year 2027/28).
The tables for the tracks are provided below.

The student must earn 12 ECTS credits as free electives chosen from the courses listed in the previous tables, from the following courses activated by the Teaching Committee, or from any course offered by the University, provided that their contents do not overlap with those of courses offered by the Computer Science degree programs or other degree programs overseen by the Department of Computer Science, and as long as they are consistent with the study plan.
Courses belonging to degree programs from a previous academic system (old-system degree programs) may not be selected.
Students may request the recognition of ECTS credits for training activities carried out at external institutions by submitting the corresponding certification. Each certification may grant up to 3 ECTS, and up to two certifications may be recognized.
Students wishing to request recognition must complete the "application" form available at:
https://www.unimi.it/en/study/student-services/welcome-desk-informastudenti/general-forms
and submit it to the student office of their degree program together with copies of the obtained certifications.
The evaluation will be carried out by a dedicated committee based on the following criteria:
– Validity: the certification must have been obtained no more than 5 years prior.
– Specialization: the certification must relate to specialized and/or professional skills.
– Level: the certification must attest to intermediate or advanced-level skills. Basic or entry-level certifications are excluded.

ADDITIONAL COURSES ACTIVATED BY THE TEACHING COMMITTEE OF COMPUTER SCIENCE AVAILABLE FOR FREE-ELECTIVE SELECTION:

FUNDAMENTALS OF DIGITAL SOCIAL MEDIA *Not activate in academic year 2026/2027*	6	INFO-01/A

"Systems" Track

ARTIFICIAL INTELLIGENCE		6	INFO-01/A
BUSINESS INTELLIGENCE		6	INFO-01/A
CRYPTOGRAPHY		6	INFO-01/A
EMBEDDED SYSTEMS		6	INFO-01/A
FORMALIZATION OF PHYSICS PROBLEMS		6	(3) PHYS-03/A, (3) PHYS-04/A
INTELLIGENT SYSTEMS AND APPLICATIONS		6	INFO-01/A
MULTIMEDIA PUBLISHING		6	INFO-01/A
QUANTUM INFORMATION AND COMPUTING		6	INFO-01/A
REAL TIME AND STREAMING ARCHITECTURES		6	INFO-01/A
SECURITY AND PRIVACY		6	INFO-01/A
“Applications” Track			
BUSINESS INTELLIGENCE		6	INFO-01/A
DATA VISUALIZATION		6	INFO-01/A
DIGITAL IMAGE PROCESSING		6	INFO-01/A
EMBEDDED SYSTEMS		6	INFO-01/A
LANGUAGES AND COMPILERS		6	INFO-01/A
MULTIMEDIA PUBLISHING		6	INFO-01/A
REAL TIME AND STREAMING ARCHITECTURES		6	INFO-01/A
SECURITY AND PRIVACY		6	INFO-01/A
SIGNAL PROCESSING		6	INFO-01/A
TECNOLOGIES AND LANGUAGES FOR WEB		6	INFO-01/A
“Methods and Foundations” Track			
ALGORITHMS AND DATA STRUCTURES II		6	INFO-01/A
CRYPTOGRAPHY		6	INFO-01/A
DECLARATIVE PROGRAMMING		6	INFO-01/A
FORMALIZATION OF PHYSICS PROBLEMS		6	(3) PHYS-03/A, (3) PHYS-04/A
LANGUAGES AND COMPILERS		6	INFO-01/A
OPERATIONS RESEARCH		6	MATH-06/A
PROGRAMMING LANGUAGES		6	INFO-01/A
QUANTUM INFORMATION AND COMPUTING		6	INFO-01/A
“Algorithms and Programming” Track			
ALGORITHMS AND DATA STRUCTURES II		6	INFO-01/A
ARTIFICIAL INTELLIGENCE		6	INFO-01/A
DATA VISUALIZATION		6	INFO-01/A
DECLARATIVE PROGRAMMING		6	INFO-01/A
DIGITAL IMAGE PROCESSING		6	INFO-01/A
INTELLIGENT SYSTEMS AND APPLICATIONS		6	INFO-01/A
OPERATIONS RESEARCH		6	MATH-06/A
PROGRAMMING LANGUAGES		6	INFO-01/A
SIGNAL PROCESSING		6	INFO-01/A
TECNOLOGIES AND LANGUAGES FOR WEB		6	INFO-01/A
End of course requirements			
ECONOMICAL, ETHICAL, SOCIAL, AND LEGAL ASPECTS OF IT		3	NN
FINAL EXAM		3	NN
TRAINING		15	NN
	Total compulsory credits	21	

COURSE PROGRESSION REQUIREMENTS

The course contains the following obligatory or advised prerequisites

Learning activity	Prescribed foundation courses	O/S
COMPUTER PROGRAMMING II	COMPUTER PROGRAMMING I	Core/compulsory
STATISTICS AND DATA ANALYSIS	MATHEMATICS I	Core/compulsory
ALGORITHMS AND DATA STRUCTURES	COMPUTER PROGRAMMING I	Core/compulsory
OPERATIONS RESEARCH	MATHEMATICS I	Core/compulsory
PROGRAMMING LANGUAGES	COMPUTER PROGRAMMING I	Core/compulsory