TEACHING REGULATIONS
BACHELOR'S DEGREE PROGRAM IN "COMPUTER ENGINEERING"
(Class L-8 INFORMATION ENGINEERING)

TITLE I – STRUCTURE OF THE DEGREE PROGRAM

Art. 1 – Introduction

1. This Regulation, drawn up pursuant to Art. 12 of Ministerial Decree of 22 October 2004, no. 270, governs the organizational and teaching aspects of the Bachelor's Degree Program in "Computer Engineering (L-8)", in compliance with current legislation, the Statute of the Guglielmo Marconi University, the University Teaching Regulations (RDA), as well as other applicable regulations.

2. The Bachelor's Degree Program in "Computer Engineering" belongs to Class L-8 of Bachelor's Degrees in "Information Engineering" as per Ministerial Decree of 19/12/2023 no. 1648.

3. This Regulation complies with the provisions set forth in the Teaching Regulations of the Degree Program, annexed to the University Teaching Regulations.

Art. 2 – Admission requirements and methods for verifying initial preparation

1. To be admitted to the Degree Program, applicants must hold a secondary school diploma or another qualification obtained abroad and recognized as suitable. Considering the specific educational objectives of the Program, applicants are also required to possess basic knowledge and skills in effective written and oral communication and in correctly interpreting the meaning of a text; basic knowledge in mathematical and physical sciences; and logical reasoning skills at the level expected upon completion of upper secondary education.

2. In order to verify possession of the required entry-level knowledge, the University has established a specific non-selective Orientation Test. Although the test does not in any way preclude enrollment in the Program, it is mandatory. If the verification outcome is not positive, the Student will be assigned specific supplementary educational requirements in the form of support learning pathways aimed at restoring basic competencies, in order to enable the Student to adequately undertake the educational path. The Orientation Test must be taken within 60 days from enrollment and, in any case, before sitting examinations.

3. The Test is divided into two Areas: one common to all Degree Programs and one specific to the chosen Program; each Area is further divided into several sections. The Common Area is divided into five sections related to basic competencies in:
   a) Text comprehension;
   b) Basic computer science;
   c) Logic;
   d) Grammar;
   e) Foreign language (English and/or French).
   The Specific Area for the Degree Program in "Computer Engineering" includes the following sections: Mathematics, Chemistry, Physics.

4. Each section is passed with at least 70% correct answers; otherwise, it is not passed. For each section not passed, the Student must, as a supplementary educational requirement, complete the missing knowledge through a Remedial Course for Entry-Level Knowledge (RCI). The RCI Course is entirely online and concludes with a written test to be taken on the platform. The test must be taken at least once within the first year of the Program. Passing the test certifies

fulfillment of the supplementary educational requirements for the relevant section. In the event of a negative outcome, the Student may take the test multiple times.

5. Students who have not fulfilled all assigned supplementary educational requirements may not sit examinations for the second and third years of the Program and will be subject to a block on exam registration until the aforementioned requirements have been fulfilled.

6. All Students who have validated examinations from a previous academic career are exempt from the verification of entry-level knowledge.

Art. 3 – Curricula, study tracks, and study plans

1. The educational organization of the Program provides for three curricula. The structure of the curricula, including the identification of the scientific-disciplinary sectors and the integer number of ECTS credits assigned to each educational area, is set out in Annex 2, which forms an integral part of this Regulation.

2. Within each curriculum, the Degree Program may provide one or more Study Tracks (Orientations) aimed at deepening specific personal interests of Students. A Study Track consists of the indication of specific activities within the sets of optional activities provided for by the curriculum and within the student-chosen activities (TAF D). The activated Study Tracks are listed in Annex 3, which forms an integral part of this Regulation, and are published before the start of each academic year on the Program's dedicated pages on the University website.

3. The Degree Program may provide a list of activities whose consistency with the educational project is automatically verified if included among the student-chosen activities (TAF D). The list of such activities, which may also include activities offered by other Degree Programs of the University or, within the framework of the agreements referred to in Art. 5, paragraph 6, by other Universities, is set out in Annex 4, which forms an integral part of this Regulation.

4. Study plans consistent with a Study Track, or consistent with a curriculum and containing student-chosen activities included in Annex 4, are automatically approved.

5. Based on justified needs, at the time of enrollment or, in any case, within the deadlines identified annually, the Student may propose an individual study plan, provided that it is consistent with the teaching regulations of the Degree Program of the academic year of enrollment. Such a proposal is accepted or rejected, with a reasoned opinion, by the competent teaching body.

Art. 4 – Educational activities

1. Annex 1, which forms an integral part of this Regulation, contains the list of courses and other educational activities that constitute the educational offering of the Degree Program. For each activity, the following are indicated (in Italian and English): the name of the activity, the specific educational objectives in summarized form, the credits, any prerequisites, the language of instruction, and the methods for assessing learning outcomes; for each course, the relevant scientific-disciplinary sectors and any division into modules are also indicated.

2. Within the deadlines established by the University, for each academic year and for each

educational activity offered by the Degree Program, a Course Syllabus Sheet is prepared, which reports, in Italian and English, in addition to what is indicated in paragraph 1: the appointed Lecturer, the specific educational objectives in detailed form (including any competencies, possibly also transversal, that the Student will have acquired at the end of the activity), the program, any prerequisites, any attendance requirements, textbooks, any ongoing assessment tests (exemptions), evaluation criteria, and office hours for student reception. The course syllabus sheets are made available on the Degree Program website and within the University Course Catalogue.

3. For enrolled Students, the Course Syllabus is also available, published on the teaching platform: a detailed expansion of the program containing at least the specific topics covered by the course; the proposed synchronous and asynchronous teaching activities (lectures, reviews, exercises, virtual classrooms, laboratories, forums, etc.); the (weekly) schedule of the proposed teaching activities; individual study activities and self-assessment tests; recommended readings and further study activities, web resources, etc.

Art. 5 – Methods of Conducting Educational Activities

1. The Study Program is offered entirely through distance learning and provides, for all Students, exclusively remote activities.

2. Asynchronous instructional teaching (which Students can access freely without time constraints) is complemented by specific moments of interactive teaching (mainly via synchronous virtual classrooms) integrated with practical exercises, in-person and virtual laboratories, case study discussions, seminars, guest presentations, and group project work, specifically providing for the synchronous execution of no less than 20% of the total hours of planned classroom teaching activities.

3. For courses delivered via distance learning, 1 ECTS credit typically corresponds to approximately 5 hours of instructional teaching and at least 1 hour of interactive teaching, provided that the total synchronous activity hours are at least 20% of the total hours of classroom teaching activities. Considering the need for replay, the physical duration of instructional teaching delivery must be multiplied by two.

4. For internships, additional language skills, IT and telematics skills, training and orientation internships, and other knowledge useful for entering the workforce, 1 ECTS corresponds to 25 hours of Student effort.

5. Within the framework of increasing integration with Italian and foreign universities or other institutions of similar cultural relevance, it is possible to replace educational activities carried out in the Study Program with activities carried out at other Italian or foreign Universities, or other institutions of similar cultural relevance; it is also possible to recognize duly certified educational activities carried out at Italian or foreign Universities, or other institutions of similar cultural relevance. This will take place within the framework of international agreements and programs, inter-university agreements, or specific agreements proposed by the competent educational structures and approved by the relevant Academic Bodies.

Art. 6 – Exams and Other Assessments of Student Achievement

1. The ECTS credits corresponding to each educational activity are acquired by the Student upon

passing the final exam or other forms of achievement assessment.

2. Student evaluation through achievement assessments is conducted at the legal headquarters or other University exam venues, in the presence of the Student, in compliance with current regulations and the University Academic Regulations, with an examination committee constituted as provided in the University Academic Regulations.

3. For educational activities attributable to courses, the exam involves not only the acquisition of ECTS credits but also the assignment of a grade expressed out of thirty, with possible honors, which contributes to determining the graduation grade. The exam is passed if the grade is equal to or greater than 18/30. For other educational activities, including foreign language proficiency, passing the assessment is certified with a "satisfactory" judgment. For activities related to internships, the acquisition of the corresponding ECTS credits is obtained through certification of the activity carried out and the internship completion certificate, according to the relevant procedures.

4. Final assessments may consist of a written test, a practical test, and/or an oral test, as indicated for each educational activity in Annex 1. The Course Syllabus referred to in Art. 4, paragraph 2, published on the course website, contains the evaluation criteria and any presence of intermediate assessment tests (exemptions). The results of intermediate tests constitute an element of final evaluation for the examination committee. The assessment methods must be the same for all Students and comply with what is indicated in the Syllabus.

5. Any further formative assessments in progress (multiple-choice tests, true/false tests, sequences of questions of varying difficulty, simulations, concept maps, papers, group projects, etc.) serve for Student self-assessment and Teacher evaluation.

6. The final achievement exam must value online work, taking into account the results of intermediate tests (if any), the quality of participation in online activities, and the results of the final in-person exam.

7. If a Student does not pass the exam, to retake the same test, the conditions indicated in the University Academic Regulations and the Student Regulations must be met.

Art. 7 – Final Exam

1. The final exam involves producing a paper, a Graduation Thesis, which includes discussion of the paper in front of a Committee and the awarding of the graduation grade.

2. In the final exam, the Student must demonstrate the ability for autonomous learning, the ability to critically analyze content related to the field of study, and the ability to communicate information appropriately to the field of study.

3. The final paper, whose production is supervised by a Faculty Advisor, must be related to topics addressed within the Degree Program and, in particular, to the subject assigned for the final exam. The final paper can consist of a written paper of a compilative, experimental, or project nature.

4. The Graduation Exam takes place in a public session, before a Committee of Faculty Members composed in accordance with the University Academic Regulations. The method for

calculating the graduation grade is as follows: the starting score with which the Candidate is admitted to the Graduation Exam is the weighted average of the grades obtained in achievement exams (weighted by the ECTS credits assigned to the courses), rounded to two decimals. For calculation purposes, a grade of 30/30 with honors is equated to 31/30. The average in thirtieths is multiplied by 110 and divided by 30 to obtain the corresponding value in one-hundred-tenths. To the starting average, the Committee may add 0 to 9 points, based on the academic record, the quality of the paper, and the presentation during the final discussion. The minimum passing grade is 66/110. For candidates who reach the score of 110/110, the Committee, unanimously, may award honors, if proposed by the Advisor.

Art. 8 – Diploma Supplement

1. Pursuant to current legislation, the University issues, as a Diploma Supplement, a certificate which also includes an English version and follows models consistent with those adopted by European countries as provided by D.D. 389 of 5 March 2019, reporting the main details regarding the specific path followed by the Student to obtain the degree.

TITLE II – OPERATIONAL RULES

Art. 9 – Attendance Requirements

1. Unless otherwise indicated within the Course Syllabus, attendance at online teaching activities is not mandatory but is highly recommended and useful for preparation and individual study.

2. Unless otherwise indicated within the Course Syllabus, formative and self-assessment tests provided by the Courses are not mandatory for admission to the exam but are considered highly recommended and useful for preparation and individual study.

3. All online activities are automatically tracked by the system and monitored by the Faculty and disciplinary tutors.

4. Unless otherwise indicated within the Course Syllabus, intermediate tests (exemptions) — where provided — are considered mandatory for admission to the exam and contribute to the formulation of the final grade.

5. Unless otherwise indicated within the Course Syllabus, the study of the indicated texts is mandatory.

6. Internship and training activities require physical attendance of the Student, in compliance with the relevant regulations.

7. According to ANVUR guidelines, Students who have attended more than 50% of online lessons are considered “Attending Students.” Students who have attended less than 50% of online lessons are considered “Non-attending Students.” Student attendance is monitored by the system through automatic tracking.

Art. 10 – Transfers from Other Study Programs and Universities

1. Transfer from other Study Programs or Universities is permitted upon verification of possession of access requirements and the Student’s initial preparation, pursuant to Art. 2 of

this Regulation. Any recognition of previous activities for shortening the study career is carried out pursuant to Arts. 11 and 12 of this Regulation.

Art. 11 – Credit Recognition

1. Recognition of previously completed educational activities must be requested prior to enrollment, transfer from another University, or course change, according to procedures defined by the University.

2. In case of transfer from other Degree Programs or Universities, any recognition of credits for previous activities is carried out according to the following criteria:
   a) Validation of previous studies is always carried out on a case-by-case basis based on certifications issued by the University of origin.
   b) Exams and previously completed academic activities are recognized based on their consistency with the Educational Plan and the specific learning objectives of the destination Study Program, and in the case of exams taken more than 10 years prior to the recognition request, after verification of the non-obsolescence of content relative to the state of the art, while ensuring recognition of the maximum possible number of credits. In particular, if the Student comes from a Study Program of the same class as the destination Program, the quota of recognized ECTS credits is at least 50% for each disciplinary-scientific sector. The Student may be asked to provide the syllabi of individual courses for further verification. Non-recognition of credits must be adequately justified.
   c) The total number of recognized credits equals the total number of credits of the recognized activities.
   d) Courses belonging to disciplinary-scientific sectors not included in the Educational Plan or (for related or integrative activities) in the Academic Regulations of the destination Program may only be recognized within and limited to elective activities (TAF D), additional educational activities (TAF F), and for language courses, in activities for the knowledge of at least one foreign language (TAF E).
   e) Results of study periods at other Italian or foreign Universities are recognized based on a previously stipulated learning agreement, as referred to in Art. 13 of this Regulation.

3. Recognition is carried out by the competent educational structure, with the support of the dedicated ECTS Office of the Central Administration.

4. In the case of validation, the recognized course is assigned the same grade obtained by the Student in the exam. If the exam was graded using a system different from the thirty-point scale, conversion is performed according to the Erasmus rules.

Art. 12 – Recognition of ECTS Credits for Extracurricular Activities

1. Pursuant to D.M. 931/2024, a maximum of 48 ECTS credits can be recognized for:
   a) professional knowledge and skills, certified according to current legislation, as well as other knowledge and skills acquired in post-secondary educational activities (such as, for example, master's programs, training and updating courses, etc.);
   b) educational activities carried out within study cycles at public administration training institutes, as well as other knowledge and skills acquired in post-secondary educational activities in which the University has contributed to the design and implementation;
   c) achievement by the Student of an Olympic or Paralympic medal or the title of absolute world champion, absolute European champion, or absolute Italian champion in disciplines

recognized by the Italian National Olympic Committee or the Italian Paralympic Committee.

2. The Student may request recognition of the activities referred to in paragraph 1 multiple times during their academic career, provided that the total number of credits recognized does not exceed the maximum limit indicated therein, and each activity can only be recognized once within the Study Program. Furthermore, recognition of activities already recognized in a Bachelor's program is not permitted within a Master's program.

3. Recognition is granted exclusively based on the competencies demonstrated by each Student. Activities for which recognition is requested must be certified by law by the entity and/or structure where they were carried out. For recognition purposes, if the activity was conducted at a public administration, the Student may submit a self-certification in accordance with Art. 46 of D.P.R. n. 445/2000; if the activity was conducted at an entity and/or structure not affiliated with the public administration, the Student must present certification issued according to the law by the entity and/or structure where the activity was carried out. The certification must also indicate the number of hours of the educational activity completed, the assessment of learning, and the skills acquired from the certified activity.

4. For the purposes of ECTS credit recognition, professional knowledge, skills, and educational activities referred to in paragraph 1, letters a) and b), must be consistent with the specific learning objectives outlined in the Educational Plan of the Study Program.

5. Recognized credits related to professional knowledge and skills can be included among elective activities (TAF D), additional educational activities (TAF F), or, if provided by the Study Program, among activities dedicated to internships and training at companies, public or private entities, or professional orders (TAF S).

6. Recognized credits related to post-secondary educational activities or activities conducted within study cycles at public administration training institutes may be included in any of the types provided for in the Study Program's Educational Plan, provided the activity is consistent with the specific learning objectives and expected learning outcomes of that type. In the case of inclusion in core, characterizing, or related activities, a disciplinary-scientific sector must be assigned to the activity (if not already present), chosen from those already provided by the Study Program's Educational Plan or, for related activities, by the Study Program's Regulations. For inclusion among core or characterizing activities, the domain of inclusion must also be identified, consistent with the assigned disciplinary-scientific sector.

7. Achievement by the Student of an Olympic or Paralympic medal or the title of absolute world champion, absolute European champion, or absolute Italian champion in disciplines recognized by the Italian National Olympic Committee or the Italian Paralympic Committee entitles the Student, upon request, to 6 ECTS credits for each medal or title achieved, up to a maximum of 12 ECTS credits, to be included among elective activities (TAF D), additional educational activities (TAF F), or, if provided by the Study Program, among activities dedicated to internships and training at companies, public or private entities, or professional orders (TAF S).

8. In any case, recognized credits assigned to a specific type or area of educational activity cannot exceed the maximum number of credits allocated to that type in the Study Program's Educational Plan.

9. For recognized activities that originally did not have a grade, no grade is assigned upon recognition, only a "satisfactory" evaluation. For recognized activities that originally included a grade, the original grade is assigned upon recognition, converted into the thirty-point scale if necessary.

10. Recognition is carried out by the competent educational structure, with the support of the dedicated ECTS Office of the Central Administration.

Art. 13 – Study Periods at Other Italian and Foreign Universities

1. The Study Program encourages national and international student mobility as a means of cultural exchange and integration into their personal and professional development for the attainment of the degree. Accordingly, study periods at Italian and foreign universities under bilateral agreements (in particular those provided by the Erasmus and Erasmus+ Programs, but also other agreements signed by the University) are recognized as an educational experience analogous to that offered by the Study Program, provided that the Student's effort is equivalent and the content is consistent with the learning path.

2. The Learning Agreement is the document defining the project of educational activities to be followed at the other university and to replace some of the activities provided by the Study Program. It establishes, in advance, an equivalent number of credits for the activities, is prepared by the Student with the support of the University's Erasmus Office, and must be approved by the competent educational structure.

3. The choice of educational activities to be completed at the other university is made to ensure that, as a whole, they aim at acquiring knowledge and skills consistent with the learning objectives of the Study Program, without requiring content equivalence, identical course titles, or one-to-one correspondence of ECTS credits between the two institutions.

4. At the end of the study period, based on the results achieved and properly documented by the other university (in the case of Erasmus/Erasmus+, through the Transcript of Records), the educational activities completed are recognized both in terms of ECTS credits earned and the grade achieved, according to the Learning Agreement.

5. Study and research activities conducted at another university, previously agreed upon, for the preparation of the final exam or internships, are recognized, in terms of ECTS credits, within the respective areas provided for in the Study Program's Educational Plan.

Art. 14 – Concurrent Enrollment in Two Study Programs

1. Pursuant to L. 12 April 2022, n. 33, D.M. 29 July 2022, n. 930, D.M. 02 August 2022, and the University Academic Regulations, the Study Program allows concurrent enrollment in another Study Program, provided it belongs to a different class and differs in at least two-thirds of the educational activities.

2. The Study Program encourages and facilitates interdisciplinary training and supports concurrent enrollment in another Degree Program through:
a) organizational methods of teaching consistent with part-time attendance, thus allowing enrollment in Study Programs with mandatory attendance, without prejudice to the minimum mandatory attendance limits regulated by Art. 9, and to the prerequisites of courses;

b) recognition, upon Student request, of credits earned for educational activities completed in one of the Study Programs in which the Student is concurrently enrolled, following the criteria and methods indicated in Arts. 12 and 13 of this Regulation;
c) in the case of educational activities shared between two different Study Programs of the same University in which the Student is enrolled, recognition is granted automatically;
d) in the case of partial recognition of educational activities completed in a Study Program, at this or another University, the Study Program promotes the organization and facilitates the Student's access to supplementary educational activities to ensure full recognition of the completed activity.

3. The methods and criteria for recognizing credits earned prior to the request for concurrent enrollment in another Degree Program are those defined in Arts. 12 and 13 of this Regulation.

Art. 15 – Orientation and Tutoring

1. Orientation activities are organized by the University, coordinated by the dedicated University service, and regulated in the University Academic Regulations. In particular, the University organizes, also in collaboration with secondary education institutions and public and private entities, orientation activities aimed at: Students of secondary schools for guided study choices; university Students currently enrolled in order to inform them about educational paths, services, and benefits; and those who have already obtained university degrees to facilitate their entry into the workforce and professions.
2. Disciplinary tutoring activities are carried out by delegated Faculty members and/or appropriately qualified individuals selected according to procedures provided in a specific University Regulation.
3. Each Student is assigned a disciplinary tutor as a point of reference with support and monitoring functions regarding class attendance.
4. Disciplinary tutoring is conducted by subject-matter experts and takes place interactively as guidance/consultancy, coordination, and monitoring of the overall class progress, coordination of Student groups, etc. These activities use the various interaction tools available (FAQ system, forums, virtual meetings, live in-depth seminars, etc.).
5. Disciplinary tutoring activities utilize an automatic tracking system for educational activities and the recording of didactic and technical monitoring activities.
6. The University also guarantees the activation of a technical tutoring service directed both at Faculty and Students, providing technical support, introduction and familiarization with the technological environment, saving and storage of materials, ongoing technical assistance, and a dedicated Help Desk.

Art. 16 – Transparency

1. For the purposes of compliance with current legislation regarding the transparency of Study Programs, any further information concerning the characteristics of the Degree Program in "Computer Engineering" (Class L-8), as well as Student services and other administrative aspects, is published and updated on the University website pages.

TITLE III – FINAL AND TRANSITIONAL RULES

Art. 18 – Approval and Amendments of the Regulation

- The Academic Regulation of the Study Program, drafted in accordance with the guidelines provided by the Academic Senate and the Board of Directors, is approved by the educational structure that manages the Program, after consultation with the competent Joint Faculty–Student Committee, and issued by Rectoral Decree.

- Amendments to this Regulation, which must comply with the guidelines provided by the Academic Senate and the Board of Directors, are approved following the same procedures indicated above and issued by Rectoral Decree.
- Upon the entry into force of any amendments to the University Academic Regulations or to the regulations of the competent educational structures, or other new provisions on the matter, verification and integration of this Regulation will in any case be carried out.

Art. 19 – Transitional Provisions

1. This Regulation applies to all Students enrolled in the Study Program and is valid for at least a number of years following its entry into force equal to the normal duration of the Program and, in any case, until the issuance of the next Regulation; it also applies, as far as compatible, to Students enrolled in other cohorts.

ANNEX 1 – LIST OF EDUCATIONAL ACTIVITIES

Name: Business Management
ECTS Credits: 6.
SSD: IEGE-01/A (formerly ING-IND/35).
Modules: Unimodular.
Learning Outcomes: The course aims to provide adequate knowledge of topics related to business management and to develop awareness of the central role of businesses in modern capitalist systems. Specifically, the course introduces the culture and language of business management through topics such as strategy, organization, and financial statements. Students will acquire knowledge of the main tools for business management, including corporate strategies, managerial techniques, and financial statement preparation.
Prerequisites: No specific requirements are needed.
Language: Italian.
Assessment Methods: The final exam consists of written and oral components.
Notes: None.

Name: Linked Data and Semantic Web
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: Unimodular.
Learning Outcomes: The course provides a comprehensive overview of the Semantic Web and Linked Data, delving into semiotics, logic, ontology, and languages such as RDF, OWL, and SPARQL. It explores technical and regulatory guidelines for the sharing of open data by public administrations, with a particular focus on W3C consortium standards. Students will develop the ability to understand and model the semantics of information, producing and evaluating conceptual models and knowledge bases.
Prerequisites: No specific prior knowledge is required to take this exam.
Language: Italian.
Assessment Methods: The exam consists of written and oral components.
Notes: None.

Name: Methods and Strategies of Digital Communication
ECTS Credits: 6.
SSD: IINF-01/A (formerly INF/01).
Modules: Unimodular.
Learning Outcomes: The course aims to enable students to understand the range of activities shared through digital technology for business communication. It will focus on Digital Marketing, web data monitoring for commercial network development, market trend analysis, and the use of Google Analytics to optimize communication.
Prerequisites: No specific requirements are needed.
Language: Italian.
Assessment Methods: The exam consists of written and oral components.
Notes: None.

Name: Next-Generation Networks
ECTS Credits: 6.
SSD: IINF-03/A (formerly ING-INF/03).
Modules: Unimodular.
Learning Outcomes: The course is aimed at providing fundamental knowledge of next-generation access networks. It will cover implementation techniques, services, transmission media, along with the economics of the Internet and business models in the telecommunications market. Students will gain an understanding of the technical, economic, and regulatory framework of next-generation networks.
Prerequisites: Basic knowledge of physics and mathematical analysis.
Language: Italian.
Assessment Methods: The exam consists of written and oral components.
Notes: None.

Name: Network Security
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: Unimodular.
Learning Outcomes: The course is designed to provide in-depth training on securing computer networks, exploring principles, threats, vulnerabilities, and protections at various levels of the OSI stack. Students will

learn encryption techniques, security analysis specific to wireless networks and mobile devices, and management of BYOD policies.
Prerequisites: Knowledge of the fundamentals of computer networks, the OSI (Open Systems Interconnection) model, and TCP/IP.
Language: Italian.
Assessment Methods: The exam is conducted in written form.
Notes: None.
Nome: Sistemi di elaborazione delle informazioni

Name: Information Processing Systems
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: Unimodular.
Learning Outcomes: The course aims to provide an introductory and structured approach to computer science, focusing on electronic computers, digital content management, Cloud Computing, and virtualization. Students will acquire knowledge of architectural models, computer networks, and the analysis of information systems in various sectors such as Industry 4.0 and digital healthcare.
Prerequisites: Basic knowledge of computer networks, the OSI model, TCP/IP, and inter-network communication.
Language: Italian.
Assessment Methods: The exam is conducted in written form.
Notes: None.

Name: AI laboratory
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: Unimodular.
Learning outcomes: Through the practical study of Artificial Intelligence, starting from theoretical principles up to the implementation of concrete solutions, the course aims to provide the student with the skills necessary to design, develop and evaluate AI systems. The training course covers the main techniques of Machine

Learning, Deep Learning, Generative AI and nfoPrompt Engineering, with particular attention to implementation aspects and development best practices.
Prerequisites: None.
Language: Italian.
Assessment methods: The exam consists in a written test.
Notes: None.

Name: Web Applications Laboratory
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: Unimodular.
Learning Outcomes: The course aims to provide a solid foundation in the development of modern web applications. Students will learn essential technologies for creating interactive and responsive web interfaces, such as HTML, CSS3, Bootstrap, and JavaScript. They will also be introduced to Progressive Web Apps (PWAs), learning to implement features such as offline caching and installation on mobile devices. The course combines theory and practice, with practical examples that allow students to immediately apply the acquired knowledge.
Prerequisites: It is recommended to have completed the Databases and Knowledge exam.
Language: Italian.
Assessment Methods: The exam consists of a written test.
Notes: None.

Name: Energy Systems
ECTS Credits: 6.
SSD: IIND-06/B (formerly ING-IND/09).
Modules: Unimodular.
Learning Outcomes: The course analyzes the entire energy cycle, from primary sources to the useful effect, exploring energy conversion, transportation, and storage. Students will study the sustainability analysis of energy systems, compare systems to achieve useful effects, and learn about the associated environmental impacts.
Prerequisites: Fundamental knowledge of physics and mathematical calculation tools.
Language: Italian.
Assessment Methods: The exam consists of a written test.
Notes: None.

Name: Software Innovation Manager
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: Unimodular.
Learning Outcomes: The course provides training on methods and best practices for managing the innovation process in the software sector. Students will learn about the definition and types of innovation, innovation management, regulatory aspects, and tools for planning and evaluating innovative projects.
Prerequisites: No specific requirements are needed.
Language: Italian.
Assessment Methods: The exam consists of a written test.
Notes: None.

Name: CAD-CAE Drawing
ECTS Credits: 6.
SSD: IIND-03/B (formerly ING-IND/15).
Modules: Unimodular.
Learning Outcomes: The course aims to provide skills in technical drawing and the use of CAD software. Students will learn the theoretical concepts of technical drawing and practical applications through CAD software, with the goal of acquiring expertise in graphic representation and the transfer of technical information.
Prerequisites: No specific prerequisites are required.
Language: Italian.
Assessment Methods: The exam includes both written and oral components.
Notes: None.

Name: Electrical Engineering
ECTS credits: 6
SSD: 09/IIET-01/A (formerly ING-IND/31)
Modules: Unimodular.
Learning Outcomes: The course aims to provide students with a solid theoretical and practical preparation on the fundamental principles of electrical engineering, applied to the design, analysis and management of electrical devices and circuits. Students will acquire the skills to address issues related to the behavior of electrical circuits, the theory of electromagnetic fields, the analysis of systems and the design of electrical devices and circuits in civil and industrial engineering. After learning theoretical and experimental aspects of electromagnetic fields and electrical circuits, students will learn to understand, draw up and solve direct and alternating current models of electrical components and circuits and therefore on quantities, laws, units and electrical measurement instruments, direct current circuits and alternating current circuits (capacitive and magnetic circuits).
Prerequisites: Basic knowledge of physics and mathematics.
(Mathematics: Elementary algebra. Trigonometric functions. Algebra of complex numbers. Graph of functions. Waveforms. Limits and derivatives of functions of one variable. Elementary vector calculus. Systems of linear algebraic equations. Linear differential equations with constant coefficients. Integrals. Transforms and inverse transforms. Physics: Fundamental concepts and laws of mechanics and electromagnetism. Bipoles and dipoles. Main physical quantities and units of measurement. Constitutive relations and graphic symbols. Insulating materials, conductors and semiconductors. Electrical resistivity of materials. Cartesian and polar coordinates. Change of references. Time and frequency domain. Force, Power, Energy, Working point, Efficiency).
Language: Italian
Assessment Methods: The exam consists in a written test.
Notes: Recommended books: "Electrical Engineering: Fundamentals, Applications and Circuits" by F. Monti, "Electrical Engineering Manual" by G. Vannini, "Electrical Circuits" by A. Sedra, "Electrical Circuits" by C. K. Alexander, "Electrical Engineering Exercises" by A. Canova, "Electrical Engineering Exam Exercises" by A. Geri, "Fundamentals of Electrical Engineering and Electronics" by L. Olivieri, "Principles and Applications of Electrical Engineering" by M. Guarnieri, "Electrical Engineering Lessons" by F. Iliceto.

Name: Fundamentals of Cybersecurity
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: Unimodular.
Learning Outcomes: The Fundamentals of Cybersecurity course provides comprehensive and practical training on a wide range of topics related to cybersecurity, from the basics of intelligence and defense to programming and threat management. By the end of the course, students will be able to recognize and manage cyberattacks, understand defense strategies, and develop programming skills for security.
Prerequisites: Knowledge of networks, including the ISO OSI stack and the functioning of the Internet, is required, as well as fundamentals of computer science such as object-oriented programming and Python.
Language: Italian.
Assessment Methods: The exam is conducted in written form.
Notes: None.

Name: ***Mathematics I***
ECTS Credits: 6.
SSD: MATH-03/A (ex MAT/05).
Modules: Unimodular.
Learning outcomes: The course provides a solid theoretical and practical foundation for addressing problems in Mathematical Analysis and Linear Algebra. Students will acquire skills in analyzing real-variable functions, performing integral calculations, studying limits, and solving linear equation systems. The course fosters the ability to apply theoretical knowledge to practical problems, develop autonomy in learning, and enhance the use of scientific language, enabling the resolution of complex problems and the exploration of alternative solutions.
Prerequisites: It is recommended to review Analytical Geometry, Elementary Algebra, and Trigonometry to consolidate the necessary foundations. To this end, practicing with one or more high school textbooks can help build a solid starting base. Additionally, the educational platform offers a preparatory course in Mathematical

Analysis, covering the main topics of Elementary Mathematics. The course is divided into two distinct sections to facilitate progressive learning.
Language: Italian.
Assessment methods: The exam consists of a written test.
Notes: None.

Name: ***Mathematics II***
ECTS Credits: 6.
SSD: MATH-03/A (ex MAT/05).
Modules: Unimodular.
Learning outcomes: The course deepens and expands the theoretical and practical knowledge acquired in Mathematics I. Students will learn to analyze multivariable functions, calculate numerical, power, and Fourier series, study improper integrals, and solve differential equations. The course fosters the ability to select appropriate problem-solving techniques, apply the scientific method, and analyze complex problems. By the end of the course, students will be autonomous in assessing their preparation, proposing alternative solutions, and employing suitable technical language to address engineering challenges.
Prerequisites: Mathematics I course.
Language: Italian.
Assessment methods: The exam consists of a written test.
Notes: None.

Name: ***General Physics***
ECTS Credits: 12.
SSD: PHYS-01/A (ex FIS/01).
Modules: Unimodular.
Learning outcomes: The course delves into the laws of classical physics, equipping students with the tools to solve problems in mechanics, thermodynamics, and electromagnetism. It also fosters the ability to apply acquired knowledge and understand its practical implications.
Prerequisites: To understand and apply most of the techniques covered in the course, it is essential to have successfully completed the Mathematics I and Mathematics II exams. The topics addressed in the General Physics course require skills such as solving single, double, and triple integrals, differentiating functions of one or more variables, analyzing functions in the Cartesian plane, solving differential equations, and mastering the algebra of differential operators. These competencies are essential prerequisites for successfully completing the course.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***Fundamentals of computer science***
ECTS Credits: 12.
SSD: IINF-05/A (ex ING-INF/05).
Modules: Unimodular.
Learning outcomes: The course provides the skills needed to understand the architecture of modern electronic computers, the fundamentals of information representation and algorithms, and the key concepts of programming, with a particular focus on Object-Oriented Programming (OOP) and the use of the JAVA language. Students will learn to develop simple programs to implement algorithms, applying OOP principles, and will be able to evaluate code execution and efficiency, prioritizing solutions optimized for performance and

readability. The course also fosters autonomy in learning, integration of knowledge from various sources, and the ability to critically analyze different implementations while using appropriate technical language.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written form.
Notes: None.

Name: ***Algorithms and data structures***
ECTS Credits: 6.
SSD: IINF-05/A (ex ING-INF/05).
Modules: Unimodular.
Learning outcomes: The course aims to develop an understanding of data structures, algorithms, and design techniques, as well as the ability to analyze their complexity. Students will learn to select and implement appropriate data structures, apply algorithmic techniques, and evaluate their efficiency and effectiveness. They will critically assess solutions, communicate clearly using pseudocode and diagrams, and independently learn new concepts. The course provides a solid foundation for tackling complex problems, fostering an analytical and creative approach, essential for a career in computer engineering and software development.
Prerequisites: To effectively engage with the Algorithms and Data Structures course, a foundational knowledge is recommended in programming (languages such as C, C++, Java, or Python), discrete mathematics (logic, set theory, graphs), calculus (differential and integral), linear algebra (vectors, matrices), computer architecture (number systems, data representation), and computer science fundamentals (algorithms and computability). Basic knowledge of probability and statistics is beneficial for some advanced topics. These foundations enable students to understand complex data structures, analyze algorithm efficiency, design algorithmic solutions, and evaluate the computational implications of algorithmic choices.
Language: Italian.

Assessment methods: The examination is conducted in written form.
Notes: None.

Name: ***Economics and business organization***
ECTS Credits: 6.
SSD: IEGE-01/A (ex ING-IND/35).
Modules: Unimodular.
Learning outcomes: The course provides knowledge of the changes brought by the Fourth Industrial Revolution, its political, economic, and social impacts, as well as key tools for strategic planning, human resource management, and innovation. Students will develop critical skills for analyzing traditional and emerging models, along with transversal competencies such as problem-solving, time management, leadership, critical and lateral thinking, and reflective evaluation, with autonomy in adapting innovative models to complex contexts.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***English language***
ECTS Credits: 6.
SSD: ANGL-01/C (ex L-LIN/12).
Modules: Unimodular.
Learning outcomes: The course aims to develop the ability to understand and use basic expressions and phrases to meet daily needs, introduce oneself, exchange information on personal, family, and routine topics, and engage in simple conversations related to living and working environments.
Prerequisites: None.
Language: English.
Assessment methods: The examination is conducted in written form.
Notes: None.

Name: ***Calculators and operating systems***
ECTS Credits: 12.
SSD: IINF-05/A (ex ING-INF/05).
Modules: Unimodular.
Learning outcomes: The course enables students to understand computer architectures and operating systems, solve logic and digital electronics problems, and develop algorithms and C programs for resource management in Unix. Students will gain skills in designing electronic systems, independently evaluating operating systems, and communicating effectively using appropriate technical language.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written form.
Notes: None.

Name: ***Object-oriented programming***
ECTS Credits: 6.
SSD: IINF-05/A (ex ING-INF/05).
Modules: Unimodular.
Learning outcomes: The course provides foundational knowledge of programming and the use of official JAVA documentation. Students will gain the ability to design, implement, and use classes to solve real-world problems, while developing communication skills to present course topics using appropriate technical language.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***Networks and the Internet***
ECTS Credits: 12.
SSD: IINF-03/A (ex ING-INF/03).
Modules: Unimodular.
Learning outcomes: The course provides fundamental knowledge of telecommunication and computer networks, the functioning of protocol layers, and key communication systems such as telephone networks, Ethernet, Wi-Fi, and the Internet. Students will acquire skills to design basic telecommunication systems, develop simple protocols or interfaces, and independently evaluate network configurations. Additionally, they will be able to integrate knowledge from various sources and effectively communicate the topics covered.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***Databases and knowledge bases***
ECTS Credits: 12.
SSD: IINF-05/A (ex ING-INF/05).
Modules: Unimodular.
Learning outcomes: The course provides knowledge of the relational model, relational algebra and calculus, and the use of the SQL language. Students will develop skills in database design, using an RDBMS, and analyzing knowledge bases. They will be able to independently evaluate choices to ensure proper data normalization, use appropriate technical language, and integrate the knowledge acquired with the requirements of future projects or advanced studies.
Prerequisites: It is essential to have knowledge of programming with imperative languages, such as PHP, to successfully complete the in-progress assessments. Familiarity with basic tools for accessing shared web spaces (e.g., FTP or SFTP) and the use of programming editors, such as Vim, is also required. A basic understanding of web development tools, particularly HTML, is recommended.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***Mathematics III***
ECTS Credits: 6.
SSD: MATH-02/B (ex MAT/03).
Modules: Unimodular.
Learning outcomes: The course expands on the skills acquired in Mathematics I and II, providing advanced tools for studying multidimensional, surface, and line integrals, with applications in mathematical physics, particularly electromagnetism. Students will develop the ability to select and apply the most effective techniques to solve complex problems, enhancing their analytical and synthesis skills through the scientific method. By the end of the course, they will be able to independently assess their preparation level, propose alternative solutions, and use appropriate technical language to tackle engineering and scientific challenges.
Prerequisites: To successfully undertake the Mathematics III course, it is essential to have passed the Mathematics I and Mathematics II exams.
Language: Italian.

Assessment methods: The examination is conducted in written form.
Notes: None.

Name: ***Digital electronics***
ECTS Credits: 6.
SSD: 09/IINF-01 (ex ING-INF/01).
Modules: Unimodular.
Learning outcomes: The course provides knowledge of the fundamental concepts of digital electronics, the operation of digital circuits, and design using HDL languages. Students will develop skills to create digital system projects, design RTL systems in VHDL, and evaluate design choices in terms of area and timing. Additionally, they will be able to integrate knowledge from various sources, analyze the potential of digital systems, and effectively communicate using appropriate technical language.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***Production systems models***
ECTS Credits: 6.
SSD: IEGE-01/A (ex ING-IND/35).
Modules: Unimodular.
Learning outcomes: The course provides knowledge of the fundamental principles of production systems, logistics, and inventory management, including planning, scheduling, and lean techniques. Students will develop skills to analyze and design production systems, solve planning and inventory management problems, interpret performance indicators and mathematical models, and independently evaluate configurations and operational methods. Additionally, they will be able to integrate information from various sources and use appropriate technical and formal language.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***Machine Learning fundamentals***
ECTS Credits: 6.
SSD: ING-INF/05
Modules: Unimodular.
Learning outcomes: Upon completing the course, students will have a solid understanding of the fundamentals of Machine Learning, including the basic concepts of regression and classification, both supervised and unsupervised. They will be able to apply key Machine Learning techniques, including logistic regression, Naive Bayes, Support Vector Machines (SVM), and clustering. Students will also understand the basics of neural networks and dimensionality reduction techniques. They will be able to apply classification and regression methods to various types of data, understanding their potential and limitations. Additionally, students will be able to express the course topics using appropriate technical language.
Prerequisites: None.
Language: Italian.
Assessment methods: The examination is conducted in written and/or oral form.
Notes: None.

Name: ***AI Innovation Manager***
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: unimoadular
Learning outcomes: This course aims to provide a broad overview of Artificial Intelligence, with a particular focus on its applications and the management of innovation and strategic management of AI projects. Particular attention is then paid to the application and management of Artificial Intelligence in a responsible and innovative way, with a complete vision of its technological, ethical, legal and business implications.

Prerequisites: None
Language: Italian
Assessment methods: The exam consists of a written test.
Notes: None.

Name: Fundamentals of Artificial Intelligence
ECTS Credits: 6
SSD: IINF-05/A (ex ING-INF/05).
Modules: 6
Learning outcomes: The course aims to provide the fundamentals of the methodologies and techniques of: symbolic approaches, discriminative and generative models of machine learning as well as generative neural architectures, in order to understand and address Artificial Intelligence issues. In the course, special attention is also paid to the main concerns and ethical implications of the use of AI solutions.
Prerequisites: None
Language: Italian
Assessment methods: The exam consists of a written test.
Notes: None.

Name: *Artificial Intelligence*
ECTS Credits: 12
SSD: IINF-05/A (ex ING-INF/05).
Modules: unimodular.
Learning outcomes: The course aims to provide methodologies and techniques of: symbolic approaches, discriminative and generative models of machine learning, and generative neural architectures, in order to understand and address Artificial Intelligence issues. It also analyses how the use of the digital technology adopted to create systems is revolutionising every aspect of our lives and how it impacts different application domains and their ethical principles and implications.
Prerequisites: None
Language: Italian
Assessment methods: The exam consists of a written test.
Notes: None.

Name: *Cybersecurity Laboratory*
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: unimodular
Learning Outcomes: The course aims to provide practical skills in the security of computer systems and data, from threats and attacks. The student will be able to identify vulnerabilities and threats and configure networks and devices to avoid or reduce attacks. In addition, he will be able to analyze network traffic, apply penetration test tools and implement encryption, hashing and authentication algorithms. Finally, he will acquire a language appropriate to this IT sector.
Prerequisites: Fundamentals of Cybersecurity
Language: Italian
Assessment Methods: The examination is conducted in written form
Notes: None

Name: *Security Innovation Manager*
ECTS Credits: 6.
SSD: IINF-05/A (formerly ING-INF/05).
Modules: unimodular
Learning Outcomes: The course provides advanced skills to manage cybersecurity at a strategic and organizational level. The student acquires the typical skills of the corporate cybersecurity manager such as information protection, risk mitigation and ensuring regulatory compliance. He/she will be able to apply and develop cybersecurity strategies for risk management and the definition of business continuity and incident response plans. He/she will also be able to identify and evaluate cyber threats and apply methodologies for the protection of sensitive data.
Prerequisites: None
Language: Italian
Assessment Methods: The examination is conducted in written form
Notes: None

Name: ***Formal Languages, Computability, and Complexity***
ECTS Credits: 6.
SSD: INF0-01/A (formely INF/01)
Modules: Single-module
Learning Outcomes: The course aims to provide students with a deep understanding of the theoretical structures that govern computation and the handling of formal languages. The main objective is to explore in detail the Chomsky hierarchy, which classifies formal languages based on their expressiveness and the types of automata required for their recognition. Through the study of finite automata, context-free grammars, Turing machines, and recursively enumerable languages, students will acquire skills in defining and analyzing algorithms for recognizing and generating these languages. The course also introduces concepts of decidability and computability, analyzing problems that can or cannot be solved through algorithms and identifying the limits of computing devices. It will also discuss major complexity classes such as P, NP, and NP-complete, providing students with tools to assess the computational difficulty of problems.
Prerequisites: Basic Mathematics, Basic Programming
Language: Italian.
Assessment Methods: The final exam consists of written and oral components.
Notes: None.

Name: ***Operation and project management***
ECTS Credits: 6.
SSD: IIND-05/A (formely ING-IND/17).
Modules: unimodular
Learning Outcomes: Upon completing the course, the student will be able to demonstrate familiarity with the fundamental concepts and tools of project management, understand the procedural and quantitative methods for initiating, planning, managing, controlling and closing a project, as well as identify critical issues in the development of a project and define solutions in an efficient and effective way. He/she will also be able to illustrate the essential characteristics of production processes and understand the fundamental principles of

performance analysis of production systems. In addition, the student will be able to analyze the management of the production process, evaluating the transformation of inputs, in the form of materials, work and energy, into outputs, in the form of goods and services, and to identify critical issues of a production process by developing strategies to improve its performance. Finally, he/she will acquire the ability to use the appropriate technical terminology in relation to production and project management.
Prerequisites: None
Language: Italian
Assessment Methods: The examination is conducted in written form
Notes: None

Name: Electrical Engineering
ECTS credits: 6
SSD: 09/IIND-08
Modules: Unimodular
Learning outcomes: The course aims to provide students with a solid theoretical and practical preparation on the fundamental principles of electrical engineering, applied to the design, analysis and management of electrical devices and circuits. Students will acquire the skills to address issues related to the behavior of electrical circuits, the theory of electromagnetic fields, the analysis of systems and the design of electrical devices and circuits in civil and industrial engineering. After learning theoretical and experimental aspects of electromagnetic fields and electrical circuits, students will learn to understand, draw up and solve direct and alternating current models of electrical components and circuits and therefore on quantities, laws, units and electrical measurement instruments, direct current circuits and alternating current circuits (capacitive and magnetic circuits).
Prerequisites: Mathematics, Physics.
Language: Italian
Assessment methods: The exam consists of a written test.
Notes: None

Name: Innovative energy systems
ECTS Credits: 6
SSD: IING-06/B (ex ING-IND/09)
Modules: Unimodular
Learning outcomes: Through basic knowledge of the energy cycle from primary source to final uses, the course aims to provide the student with basic skills relating to the analysis of even complex energy systems in terms of efficiency and effectiveness, with particular attention to innovative solutions for the sustainable development of energy systems
Prerequisites: None
Language: Italian
Assessment methods: The exam consists of a written test
Notes: None

Name: Operation and project management
ECTS Credits: 6.
SSD: IIND-05/A (formely ING-IND/17).
Modules: unimodular
Learning Outcomes: Upon completing the course, the student will be able to demonstrate familiarity with the fundamental concepts and tools of project management, understand the procedural and quantitative methods for initiating, planning, managing, controlling and closing a project, as well as identify critical issues in the development of a project and define solutions in an efficient and effective way. He/she will also be able to illustrate the essential characteristics of production processes and understand the fundamental principles of performance analysis of production systems. In addition, the student will be able to analyze the management

of the production process, evaluating the transformation of inputs, in the form of materials, work and energy, into outputs, in the form of goods and services, and to identify critical issues of a production process by developing strategies to improve its performance. Finally, he/she will acquire the ability to use the appropriate technical terminology in relation to production and project management.
Prerequisites: None
Language: Italian
Assessment Methods: The examination is conducted in written form
Notes: None

Name: ***Media law, social media and Internet***
CFU: 6
SSD: GIUR-05/A (ex IUS/09)
Modules: Unimodular.
Training objectives: The course aims to analyze the problems related to information technology law by observing the general aspects relating to the legal issues introduced by new technologies, the sources and protection of related rights.
Prerequisites: Constitutional Law.
Delivery language: Italian.
Exam methods: The exam consists of a written or oral test.
Notes: None.

APPENDIX 2 – CURRICULUM

Name: Software Development

Entry Requirements: None

Type	Area	SSD	ECTS
Basic activities	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05) IINF-05/A (ex ING-INF/05) INFO-01/A (ex INF/01)	30
	Physics and Chemistry	02/PHYS-01 (ex FIS/01)	12
Characterizing Activities	Computer Engineering	IINF-05/A (ex ING-INF/05)	48
	Telecommunications Engineering	IINF-03/A (ex ING-INF/03)	12
	Management Engineering	IEGE-01 (ex ING-IND/35) IIND-05/A (ex ING-IND/17)	6
Related or Supplementary activities		MATH-02/B (ex MAT/03) IINF-05/A (ex ING-INF/05) IINF-01/A (ex ING-INF/01)	30
Other activities	Electives		12
	For the final exam and foreign language	For the final exam	6
		For knowledge of at least one foreign language	6
	Additional training activities	Computer and telecommunications skills	6
		Training and orientation internships	12
			180

Year	Name	Type	Area	SSD	ECTS
First	Mathematics I	A	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05)	6
	Mathematics II	A	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05)	6
	General Physics	A	Physics and Chemistry	02/PHYS-01 (ex FIS/01)	12
	Fundamentals of Computer Science	A	Mathematics, Computer Science, and Statistics	IINF-05/A (ex ING-INF/05)	12
	Formal Languages, Computability, and Complexity	A	Mathematics, Computer Science, and Statistics	INFO-01/A (ex INF/01)	6
	Algorithms and Data Structures	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Logic Networks and Neural Networks	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Language Proficiency: English	E	Foreign Language		6
Second	Computers and Operating Systems	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	12
	Object-Oriented Programming	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Networks and the Internet	B	Telecommunications Engineering	IINF-03/A (ex ING-INF/03)	12
	Databases and Knowledge Bases	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	12
	CHOICE BETWEEN: Group 1	B	Management Engineering		6
	Mathematics III	C	Mathematics, Computer Science, and Statistics	MATH-02/B (ex MAT/03)	6
	Fundamentals of Software Engineering	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
Third	Web Applications Lab	C	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Software Innovation Manager	C	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Related and Supplementary Activities	C	1 or 2 subjects chosen from Group 2		12
	Electives 1	D			6
	Electives 2	D			6

	Additional Educational Activities	F	Computer and telematics skills	`Virtual laboratories`	6
		F	Training and orientation internships	Curricular internships	12
	Final Exam	E	Final Exam		6

Group 1 – 6 CFU
- Economics and business organization – 6 CFU, IEGE-01 (ex ING-IND/35)
- Production system models – 6 CFU, IEGE-01 (ex ING-IND/35)
- Business management – 6 CFU, IEGE-01 (ex ING-IND/35)
- Operation and project management – 6 CFU, IIND-05/A (ex ING-IND/17)

Group 2 – 12 CFU
- Digital Electronics – 6 CFU, IINF-01/A (ex ING-INF/01)
- Fundamentals of Cybersecurity – 6 CFU, IINF-05/A (ex ING-INF/05)
- Network Security – 6 CFU, IINF-05/A (ex ING-INF/05)
- Fundamentals of Artificial Intelligence – 6 CFU, IINF-05/A (formerly ING-INF/05)
- Artificial Intelligence – 12 credits, IINF-05/A (formerly ING-INF/05)
NOTE: Fundamentals of Artificial Intelligence and Artificial Intelligence are mutually exclusive.

Name: Artificial Intelligence
Admission Requirements:
None

Type	Area	SSD	ECTS
Basic Activities	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05) IINF-05/A (ex ING-INF/05) INFO-01/A (ex INF/01)	30
	Physics and Chemistry	02/PHYS-01 (ex FIS/01)	12
Characterizing Activities	Computer Engineering	IINF-05/A (ex ING-INF/05)	54
	Telecommunications Engineering	IINF-03/A (ex ING-INF/03)	12
	Management Engineering	IEGE-01 (ex ING-IND/35) IIND-05/A (ex ING-IND/17)	6
Related or Supplementary activities		MATH-02/B (ex MAT/03) IINF-05/A (ex ING-INF/05) IINF-01/A (ex ING-INF/01)	24
Other activities	Electives		12
	For the final examination and foreign language	For the final examination	6
		For the knowledge of at least one foreign language	6
	Additional activities	IT and telematics skills	6
		Training internships, guidance and placement	12
		Total	**180**

Year	Name	Type	Area	SSD	ECTS
First	Mathematics I	A	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05)	6
	Mathematics II	A	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05)	6
	General Physics	A	Physics and Chemistry	02/PHYS-01 (ex FIS/01)	12
	Fundamentals of Computer Science	A	Mathematics, Computer Science, and Statistics	IINF-05/A (ex ING-INF/05)	12
	Formal Languages, Computability, and Complexity	A	Mathematics, Computer Science, and Statistics	INFO-01/A (ex INF/01)	6

	Algorithms and Data Structures	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Logic Networks and Neural Networks	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Language Proficiency: English	E	Foreign language		6
Second	Computers and operating systems	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	12
	Object-Oriented Programming	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Networks and the Internet	B	Telecommunications Engineering	IINF-03/A (ex ING-INF/03)	12
	Databases and Knowledge Bases	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	12
	ELECTIVES FROM: GROUP 1	B	Computer Engineering		6
	Artificial Intelligence	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	12
Third	Machine Learning Fundamentals	C	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	AI Innovation Manager	C	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	IA Lab	C	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Related and Supplementary Activities	C	1 subject chosen in Group 2		6
	Electives 1	D			6
	Electives 2	D			6
	Additional Training Activities	F	Computer and telematics skills	Virtual laboratories	6
		F	Training and orientation internships	Curricular internships	12
	Final exam	E	Final exam		6

Group 1 – 6 ECTS

- Economics and business organization – 6 CFU, IEGE-01 (ex ING-IND/35)

- Production system models – 6 CFU, IEGE-01 (ex ING-IND/35)

- Business management – 6 CFU, IEGE-01 (ex ING-IND/35)

- Operation and project management – 6 CFU, IIND-05/A (ex ING-IND/17)

Group 2 – 6 ECTS

- Mathematics III – 6 CFU, MATH-02/B (formerly MAT/03)

- Digital Electronics – 6 CFU, IINF-01/A (ex ING-INF/01)

- Fundamentals of Cybersecurity – 6 CFU, IINF-05/A (ex ING-INF/05)

- Network Security – 6 CFU, IINF-05/A (ex ING-INF/05)

Name: Cybersecurity Entry
Requirements: None

Type	Area	SSD	ECTS
Basic activities	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05) IINF-05/A (ex ING-INF/05) INFO-01/A (ex INF/01)	30
	Physics and Chemistry	02/PHYS-01 (ex FIS/01)	12
Characterizing activities	Computer Engineering	IINF-05/A (ex ING-INF/05)	48
	Telecommunications Engineering	IINF-03/A (ex ING-INF/03)	12
	Management Engineering	IEGE-01 (ex ING-IND/35) IIND-05/A (ex ING-IND/17)	6
Related or Supplementary activities		MATH-02/B (ex MAT/03) IINF-05/A (ex ING-INF/05) IINF-01/A (ex ING-INF/01)	30
Other activities	Electives		12
	For the final exam and foreign language	For the final exam	6
		For knowledge of at least one foreign language	6
	Additional training activities	Computer and telecommunications skills	6
		Training and orientation internships	12
		Total	**180**

Year	Name	Type	Area	SSD	ECTS
First	Mathematics I	A	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05)	6
	Mathematics II	A	Mathematics, Computer Science, and Statistics	MATH-03 (ex MAT/05)	6
	General Physics	A	Physics and Chemistry	02/PHYS-01 (ex FIS/01)	12
	Fundamentals of Computer Science	A	Mathematics, Computer Science, and Statistics	IINF-05/A (ex ING-INF/05)	12
	Formal Languages, Computability, and Complexity	A	Mathematics, Computer Science, and Statistics	INFO-01/A (ex INF/01)	6
	Algorithms and Data Structures	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Logic Networks and Neural Networks	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Language Proficiency: English	E	Foreign language		6

Second	Computers and Operating Systems	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	12
	Object-Oriented Programming	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Networks and the Internet	B	Telecommunications Engineering	IINF-03/A (ex ING-INF/03)	12
	Databases and Knowledge Bases	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	12
	ELECTIVES FROM: GROUP 1	B	Management Engineering		6
	Mathematics III	C	Mathematics, Computer Science, and Statistics	MATH-02/B (ex MAT/03)	6
	Cybersecurity Fundamentals	B	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
Third	Network Security	C	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Cybersecurity Lab	C	Computer Engineering	IINF-05/A (ex ING-INF/05)	6
	Supplementary Activities	C	1 or 2 subjects chosen from Group 2		12
	Scelta libera 1	D			6
	Scelta libera 2	D			6
	Additional Training Activities	F	Computer and IT skills	Virtual Workshops	6
		F	Training and orientation internships	Curricular Internships	12
	Final Exam	E	Final Exam		6

Group 1 – 6 ECTS
- Economics and business organization – 6 CFU, IEGE-01 (ex ING-IND/35)
- Production system models – 6 CFU, IEGE-01 (ex ING-IND/35)
- Business management – 6 CFU, IEGE-01 (ex ING-IND/35)
- Operation and project management – 6 CFU, IIND-05/A (ex ING-IND/17)

Group 2 – 12 ECTS
- Digital Electronics – 6 CFU, IINF-01/A (ex ING-INF/01)
- Security Innovation Manager – 6 CFU, IINF-05/A (ex ING-INF/05)
- Fundamentals of Software Engineering – 6 CFU, IINF-05/A (ex ING-INF/05)
- Fundamentals of Artificial Intelligence – 6 CFU, IINF-05/A (formerly ING-INF/05)
- Artificial Intelligence – 12 credits, IINF-05/A (formerly ING-INF/05)
NOTE: Fundamentals of Artificial Intelligence and Artificial Intelligence are mutually exclusive.

APPENDIX 3 – ORIENTATION

The L8 Program does not offer orientation within the various curricula.

ANNEX 4 – ELECTIVES (TAF D)

Courses offered by this program:

Fundamentals of Artificial Intelligence – 6 credits, IINF-05/A (formerly ING-INF/05) Artificial Intelligence – 12 credits, IINF-05/A (formerly ING-INF/05)

Fundamentals of Machine Learning – 6 credits, IINF-05/A (formerly ING-INF/05) AI Innovation Manager – 6 credits, IINF-05/A (formerly ING-INF/05) AI Lab – 6 credits, IINF-05/A (formerly ING-INF/05)

Fundamentals of Cybersecurity – 6 credits, IINF-05/A (formerly ING-INF/05) Network Security – 6 credits, IINF-05/A (formerly ING-INF/05)

Security Innovation Manager – 6 credits, IINF-05/A (formerly ING-INF/05) Cybersecurity Lab – 6 Credits, IINF-05/A (formerly ING-INF/05) Mathematics III – 6 credits, MATH-02/B (formerly MAT/03)

Fundamentals of Software Engineering – 6 credits, IINF-05/A (formerly ING-INF/05) Software Innovation Manager – 6 credits, IINF-05/A (formerly ING-INF/05) Web Applications Lab – 6 credits, IINF-05/A (formerly ING-INF/05)

Business Economics and Organization – 6 credits, IEGE-01 (formerly ING-IND/35) Production System Models – 6 credits, IEGE-01 (formerly ING-IND/35) Business Management – 6 credits, IEGE-01 (formerly ING-IND/35)

Operational and Project Management – 6 credits, IIND-05/A (formerly ING-IND/17)

Digital Electronics – 6 credits, IINF-01/A (formerly ING-INF/01)

Information Processing Systems – 6 credits, IINF-05/A (formerly ING-INF/05) Linked Data and Semantic Web – 6 credits, IINF-05/A (formerly ING-INF/05)

Next-Generation Networks – 6 credits, IINF-03/A (formerly ING-INF/03)

Courses offered by the Industrial Engineering program:

Electrical Engineering – 6 credits, IIET-01/A (formerly ING-IND/31)

Innovative Energy Systems – 6 credits, IIND-06/B (formerly ING-IND/09)

Courses offered by the Single-Cycle Master's Program in Law:

Media Law, Social Media, and the Internet – 6 credits, GIUR-06/A (formerly IUS/10)