Department of Mechanical, Energy, Management and Transport Engineering (DIME)

Master's degree course in Safety Engineering for Transport, Logistics and Production

Class LM-26 – Safety Engineering
TEACHING REGULATIONS – Intake 2022/2024
Approved by resolution of the Council of the Course of Study on 2nd May 2022

General Part

INDEX

Art. 1 Premise and area of competence

The present Teaching Regulations, in accordance with the Statute and Teaching Regulations of the University of Genoa (general part and special part), determine the organisational aspects of the teaching activity of the master's degree course in Safety Engineering for Transport, Logistics, and Production, as well as any other subject of relevance based on other legislative and regulatory sources.

The Teaching Regulation of the master's degree course in Safety Engineering for Transport, Logistics, and Production is approved, pursuant to article 25 - paragraphs 1 and 4 - of the Teaching Regulations of the University of Genoa, general part, by the Council of the Course of Study (CCS) of Safety Engineering based on the majority vote among its members and submitted approval to the Council of the Department of Mechanical, Energy, Management, and Transportation Engineering (DIME), after consultation with the Polytechnic School, with the prior favourable opinion of the Teachers-Student Joint Committee of the Polytechnic School.

The resolutions of the CCS can also be taken in telematic mode according to the above-mentioned regulations and, in particular, to article 14 "meetings with telematic mode" of the current General Regulations of the University (in force since 19/12/2018).

Art. 2 Admission requirements and procedures for verifying individual preparation

Admission to the master's degree course in Safety Engineering for Transport, Logistics, and Production is subject to the possession of specific curriculum requirements and adequate personal preparation. Requirements must be met before the individual preparation can be checked.

Requirements: To enrol to the master's degree course in Safety Engineering for Transport, Logistics, and Production, knowledge equivalent to those provided by the general training objectives of all three-years degrees in Civil and Environmental Engineering, Information Engineering, Industrial Engineering (Classes L-7, L-8, and L-9 of DM 270/2004) is required.

Indeed, all following requirements are required:

- possession of a bachelor's degree or master's degree, as per to Ministerial Decree 509/1999 or Ministerial Decree 270/2004, obtained at an Italian University, or a five-year degree (prior to Ministerial Decree 509/1999), obtained at an Italian University, or equivalent qualifications;
- possession of at least 36 CFU (Italian university educational credits, equivalent to the European Credit Transfer and Accumulation System - ECTS) or equivalent knowledge, acquired in any university degree course (bachelor's, master's, five-year master's, first and second level "Master Universitario") in the disciplinary-scientific sectors (SSD) indicated for the basic educational activities of the classes L-7, L-8, L-9;
- possession of at least 45 CFU or equivalent knowledge, acquired in any university degree course (bachelor's, master's, five-year master's, first and second level "Master Universitario") in the SSD indicated for the educational activities characterising the classes L-7, L-8, L-9;
- adequate knowledge of the English language equivalent at least to the B2 level.

Every bachelor's degree course in engineering awarded by University of Genoa meets the curricular requirements of the master's degree course.

In case of possession of different degrees from those above indicated and in case of foreign students, the CCS will verify the fulfilment of the curricular requirements or the possession of an equivalent knowledge based on the exams taken during the previous degree course, the ranking of the University which provided the degree, as well as the presence of any extracurricular exams, internship activities, and work experience.

Personal preparation: To be admitted to the master's degree course, students in possession of the curriculum requirements must pass a test aimed at verifying their personal preparation, except in the cases described in the last paragraphs.

The test will be carried out in the form of a written test or a public interview and will be aimed at ascertaining the general preparation of the student with reference to the knowledge of fundamental notions of mathematics and physics, as well as of applicative and professional aspects related to engineering topics.

The test will be held in front of an Examination Commission appointed by the CCS and composed of faculty lecturers belonging to the CCS. The result of the test only includes the words "passed", "not passed".

The composition of the Examination Commission, the methods of the test, the place and date of the test, the subjects to be examined and the evaluation criteria of the candidates are indicated in the "Call for Admission to the master's degree courses of the Polytechnic School" and on the website of the present master's degree course.

The personal preparation is assumed to be adequate for the candidates who have obtained an Italian bachelor's degree, or a qualification considered to be equivalent, with a final mark of at least 9/10 of the maximum achievable grade of their degree.

The personal preparation of the candidates who have obtained a non-Italian bachelor's degree, or a qualification considered to be equivalent, is assessed directly during the check of requirements and based on the provided documentation.

English Knowledge: A student certifies his/her English proficiency at the B2 level or higher by means of appropriate certificates in his/her possession or, in the absence thereof, by passing the B2 test organized by the Language Skills Development Sector of the University of Genoa (ex-CLAT UniGe). The English proficiency requirement is also satisfied if the student holds a degree in English, to be certified through an official document or letter issued by the corresponding university and indicating that his/her studies were pursued in English. If the previous conditions are not fulfilled, English proficiency must be evaluated within the aforementioned personal preparation test by the corresponding Examination Committee. In this last case, the ability to use the English language fluently is also among the subjects of this test.

For non-EU citizens with residence abroad and foreign degree, the application for a Master program of the University of Genoa taught in English must be submitted through a dedicated web portal, selected and adequately promoted by the University.

After the upload of the documents, a check is made about their completeness. Candidates who pass the eligibility check move on to the next stage concerning the assessment of qualifications and the final evaluation, after which the student will be assessed as "accepted", "conditionally accepted" (allocation of bridge careers) or "rejected".

The maximum allowed number of enrolled non-EU students is established by the CCS every year, communicated to the University International Student Office (Settore Accoglienza Studenti Stranieri di Ateneo) and published on the Universitaly website.

Art. 3 Educational activities

The list of courses and other possible educational activities, in the intake 2022-2024, is given in the relevant annex (Annex 1), which constitutes an integral part of these regulations. A responsible lecturer is identified for each class.

A lecturer responsible of a class is whoever is charged of teaching in accordance with the law, i.e., he/she whom the relative Department Council has attributed the responsibility when assigning teaching tasks to lecturers.

The language of the educational activities (classes, exercises, workshops) shall be English, as explicitly decided by the CCS.

Art. 4 Enrolment to individual educational activities

In accordance with Article 5 of the Regulations of the University of Genoa for students, a requirement to enrol in individual training activities consists of having a qualification that allows accessing the university.

Art. 5 Curricula

The master's degree course in Safety Engineering for Transport, Logistics, and Production is not structured in curricula.

Art. 6 Total time commitment

For each class, the definition of the hourly fraction dedicated to lessons or equivalent teaching activities is established by the CCS and specified in the special part of these regulations (Annex 1).

In any case, the correspondence between classroom hours and CFUs is assumed to take values in the range: 8 ÷ 10 hours of classes or assisted teaching activity per CFU.

For each class, the definition of the expected total time commitment reserved for personal study or other educational activities of an individual type, is written in the special part of these regulations (Annex 1).

The Director of the DIME and the Head of the CCS shall be responsible for verifying compliance with the above requirements, including for the purpose of the publication of syllabuses of the classes.

Art. 7 Study plans and prerequisites

Students can enrol full-time or part-time; for these two types of students there are different rights and duties.

Each student chooses the type of registration simultaneously with the presentation of his/her study plan.

Each full-time student carries out his/her educational activity considering the study plan established by the master's degree course, which is organized into two distinct years and published in the Degree Programme Table of the master's Degree Course. The study plan formulated by the student must contain an indication of the educational activities, along with the related credits that he/she intends to achieve and that are provided by the official study plan for the corresponding teaching period, up to a maximum of 65 CFU per year.

Each part-time student is required to submit an individual study plan specifying the number of CFU he/she intends to include, according to the regulations on the university fees of the University of Genoa.

If the study plan is not submitted by the due date, a standard plan will be uploaded ex officio, except if the submission of an individual study plan is mandatory (e.g., change of course of study, previous part-time individual study plan).

The enrolment of full-time and part-time students is regulated by the Regulations of the University of Genoa for students considering the operational provisions approved by the Central government bodies and indicated in the Student's Guide (which is published annually on the University website). The student's educational path can be bound by a system of prerequisites, indicated for each class in the special part of these Regulations (Annex 1).

Through an explicit and motivated resolution, the CCS can authorise students who have demonstrated particularly high academic performance in the previous academic year to include in their study plan more than 65 CFU but, in any case, not more than 75 CFU. "Particularly high performance" means that the student has passed all the exams of his/her study plan by the month of September.

A study plan with a shorter duration than the nominal one needs approval from the CCS.

The modality and deadline for the submission of the study plan are established annually by the Polytechnic School and reported in the Degree Programme Table available on the website of the University of Genoa and can be reached from the website of the master's degree course.

Art. 8 Attendance to and modalities of the teaching activities

The courses take the form of: (a) lectures, including distance learning by telematic means; (b) practical exercises; (c) laboratory exercises (d) thematic seminars.

The complexity and the demanding nature of the classes taught in the master's degree course make the attendance to the educational activities strongly recommended for an adequate understanding of the topics and therefore for a good success in the exams.

The class schedule is divided into semesters. As a rule, the semester is divided into at least 12 weeks of classes plus at least 4 weeks overall for verification tests and examinations.

The examination period ends with the beginning of the classes of the following semester.

In the middle of the semester, the normal teaching activity (lessons, exercises, laboratories) can be interrupted according to the indications provided by the Polytechnics School.

The class schedule for the entire academic year is published, before the start of the classes of each academic year, on the website of the University of Genoa and can be reached from the website of the master's degree course. The class schedule guarantees the possibility of attending each year of the course as planned in the current Degree Programme Table of master's degree course.

For practical reasons, the compatibility among the timetables of all the formally possible elective classes is not guaranteed. Students must then formulate their study plan also considering the timetable of the classes.

Art. 9 Examinations and other performance verifications

Examinations can be carried out in written, oral, or written and oral, according to the methods indicated in the sheet of each class, which is published on the website of the University of Genoa and can be reached from the website of the master's degree course.

Upon request, specific learning verification arrangements may be provided in accordance with the needs of disabled students or students with specific learning disorders (D.S.A.), in compliance with article 20 - paragraph 4 - of the Teaching Regulations of the University of Genoa.

In case of classes structured in modules with several lecturers, all such lecturers collectively participate in the overall evaluation of the student's performance which cannot, in any case, be split into separate evaluations on the individual modules.

The examination schedule is established by the deadline defined by the Ministry for the following academic year, is published on the website of the University of Genoa and can be reached from the website of the master's degree course.

Examinations are held during periods of interruption of classes. Examinations may be planned during the period of the classes only for students who, in the current academic year, have not included educational activities in their study plan.

Before taking the final examination, each student must pass the exams of all his/her classes by the deadline defined by the Student Office of the Polytechnic School and indicated in the "memo" that is published on the website of the University of Genoa and can be reached from the website of the master's degree course.

The result of each examination, with the mark obtained, is recorded in accordance with article 20 of the Teaching Regulations of the University of Genoa.

The Examination Committees of all the classes are appointed by the director of DIME or, on his behalf, by the head of the master's degree course. For each class, the Examination Committee is composed of at least two members. For each exam session, at least two members participate. The lecturer responsible of a class is a member of the related Examination Committee in the capacity of president of this committee. "Cultori della Materia" nominated by the CCS based on scientific, didactic, or professional criteria are allowed to be members of the Examination Committee. These criteria are held valid in the case of retired faculty lecturers. When the Examination Committee is nominated, a deputy president is also nominated. Each exam session is chaired by either the president or a deputy.

Art. 10 Acknowledgement of credits

The CCS decides upon the approval of applications for change from another degree course of the University of Genoa or application for transfer from other universities in accordance with the rules provided for in the Teaching Regulations of the University of Genoa, article 18. It also decides upon the approval, in the form of educational credits and for a maximum number of 12 CFU, of professional knowledge and skills certified in accordance with the current legislation.

The evaluation of applications for change will consider the didactic specificities and the up-to-dateness of the educational content of the individual exams taken by the applicant, reserving the right to establish any forms of verification and supplementary exams on a case-by-case basis.

Within the framework of the national and regional legislation on education/work alternation (e-.g., internships), it is possible for the CCS to provide, for selected students, learning paths that also consider work experiences carried out at companies with which proper agreements have been established.

Art. 11 Mobility, studies abroad, international exchanges

The CCS strongly encourages internationalisation activities, in particular students' participation in mobility and international exchange programmes. For this purpose, it shall ensure, in accordance with the rules in force, the approval of the educational credits obtained within these programmes and shall appropriately organise the educational activities in order to make these activities efficient and effective.

The CCS acknowledges, for each enrolled student who has regularly completed a period of study abroad, the exams passed during such a period and of the relevant credits with which the student proposes to replace some of the exams in his/her own study plan.

For the purpose of the acknowledgement of these examinations, each student, when submitting the plan of training activities, he/she intends to attend at the university abroad, must submit suitable documentation proving the equivalence between the content of the classes abroad and the content of the classes that are taught in the master's degree course that he/she intends to replace. Equivalence shall be evaluated by the CCS.

The conversion of the marks will take place according to the criteria approved by the CCS, in compliance with the European ECTS system.

Concerning periods spent abroad and dedicated to the preparation of the thesis, the number of credits recognized is related to the duration of the period itself.

Art. 12 Procedures for the final examination

The final examination consists of the presentation and discussion of a written dissertation before a special commission, aimed at ascertaining the candidate's technical-scientific and professional preparation.

For the purposes of obtaining a master's degree, the final examination consists of the writing of a dissertation, elaborated by the student in an original way under the guidance of one or more supervisors, on a subject relevant to the educational objectives of the master's degree course.

Among the supervisors there must be at least one lecturer of the Polytechnic School or of the master.

The thesis dissertation must be written in English. The use of another EU language requires the authorization of the CCS.

The thesis dissertation must point out the student's ability to deal with research and/or application issues. The thesis dissertation must consist of a project and/or the development of an application that proposes innovative solutions with respect to the state of the art and demonstrates the student's analytical and design skills.

The dissertation can be of experimental, numerical, or theoretical nature and can be carried out in external companies or bodies, public or private.

The dissertation must also reveal:

- capability to deal with complex problems with a multidisciplinary approach;
- correct use of sources and bibliography;
- systematic and argumentative skills;
- clarity in the exposition;
- design and experimental skills;
- critical skills.

The Final Examination Committee is composed of at least five members including the President and is appointed by the Director of DIME.

The procedure for the final examination consists of an oral presentation of the dissertation by the student to the Final Examination Committee, followed by a discussion of any questions raised by the members of the Committee.

If the final exam is passed, the Committee assigns a mark varying from 0 to 6 to be summed to the average of the marks obtained in the examinations of the educational activities that require a final mark and weighted on the number of CFU associated with the individual educational activities.

The mark is the sum of the following contributions:

- student's career including periods of study abroad (up to 1 point);
- evaluation of the thesis work (up to 4 points);
- evaluation of the final exam and its exposure (up to 1 point).

It is also possible to confer the “dignity of press” to theses for which an article in camera-ready format has been sent to the Commission at least one week before the graduation, with an indication of the conference or magazine to which it has been or will be submitted.

Art. 13 Guidance services and tutoring

The Polytechnic School, in agreement with DIME, organizes and manages orientation and tutoring services for students, aiming at preventing dropout and delays in studies and at promoting a fruitful participation in university life in all its forms.

The CCS identifies within itself a number of tutors in proportion to the number of the enrolled students. The names of the tutors can be found on the website of the master’s degree course.

Art. 14 Verification of the obsolescence of credits

CFU acquired within the framework of the master’s degree course can be subject to an obsolescence verification after 6 years. If the CCS decides upon the obsolescence of even a single part of the relevant educational content, it establishes the supplementary tests that must be taken by the student, defines the topics, the verification modalities, and the composition of the Examination Committee.

Once the required tests have been passed, the CCS validates the credits acquired with a resolution. If the related educational activity provides a mark, this mark may update the one previously obtained by the student, upon proposal from the Examination Committee that carried out the verification.

Art. 15 Degree Programme Table

DIME, after consulting the Polytechnic School, approves and publishes annually the Current Year Degree Programme Table on the website of the University and of the master’s degree course. In the Current Year Degree Programme Table, the main provisions of the teaching system and the

teaching regulations of the master’s degree course, as well as relevant additional information, are indicated.

The Degree Programme Table of the master’s degree course contains the list of the classes activated for the corresponding academic year. The sheets of the individual classes are published on the website of the University and of the master’s degree course.

Annex 1 to the Teaching regulations of the master's degree course in Safety Engineering for Transport, Logistics, and Production

List of educational activities and related educational objectives

PLANNED TEACHING ACTIVITY A.Y. 2022/2023
TEACHING REGULATIONS SPECIAL PART COHORT 2022/2023
10377 SAFETY ENGINEERING FOR TRANSPORT, LOGISTICS, AND PRODUCTION LM-26 GE

Year	Code	Teaching course_IT	Teaching course_EN	CFU	SSD	Type	Area	Language	Prerequisites	Learning outcomes	Hours of assisted teaching activity	Hours of personal study
1	90442	OPTIMIZATION AND CONTROL OF TRANSPORT AND LOGISTICS	OPTIMIZATION AND CONTROL OF TRANSPORT AND LOGISTICS	10	ING-INF/04	CORE ACTIVITY	Safety Engineering and Information Security	English			0	0
1	90443	OPTIMIZATION AND CONTROL METHODS	OPTIMIZATION AND CONTROL METHODS	5	ING-INF/04	CORE ACTIVITY	Safety Engineering and Information Security	English		The goal is that of making the students achieve the capacity modeling dynamic systems and solving control problems involving the optimization of some performance index.	45	80
1	90444	MODELLING AND CONTROL OF TRAFFIC SYSTEMS	MODELLING AND CONTROL OF TRAFFIC SYSTEMS	5	ING-INF/04	CORE ACTIVITY	Safety Engineering and Information Security	English		The goal of this course is that of developing and applying modeling and optimization tools to solve problems dealing with performance analysis and optimization of traffic networks. Different classes of dynamic models of traffic networks will be presented, based on various assumptions about the architecture for information exchange among the decision makers. Real time control problems are considered and possible control schemes are presented. The application of such schemes is discussed also with respect to the computational requirements and the needs for communication.	45	80
1	90445	TRANSPORT SYSTEMS ENGINEERING	TRANSPORT SYSTEMS ENGINEERING	12	ICAR/05	RELATED OR SUPPLEMENTARY ACTIVITY	Related or supplementary learning activity	English			0	0
1	90446	TRANSPORT SYSTEMS PLANNING	TRANSPORT SYSTEMS PLANNING	6	ICAR/05	RELATED OR SUPPLEME	Related or supplementa	English		The goal of the course is providing the basic analytical tools for the study of transport systems, including: supply models of transport	54	96

						NTARY ACTIVITY	ry learning activity			infrastructures and services, probability theory and random choice, behavioural and non-behavioural demand models, and assignment models and algorithms both with optimization and fixed-point approaches. All the topics will be faced from the point of view of theory and applications.		
1	101499	SAFE AND RELIABLE TRANSPORT SYSTEMS	SAFE AND RELIABLE TRANSPORT SYSTEMS	6	ICAR/05	RELATED OR SUPPLEMENTARY ACTIVITY	Related or supplementary learning activity	English		At the end of the course, the student will be able to describe and discuss combinatorial methods and state-based approaches for the assessment of safety and security aspects in the context of transport and logistic systems. In particular, the student will be able to create models for safety and reliability assessment based on Fault Tree Analysis, Event Tree Analysis, Bayesian networks, Petri nets and Markov chains.	54	96
1	90448	TRANSPORT SAFETY LAW	TRANSPORT SAFETY LAW	10	IUS/14	CORE ACTIVITY	Law and Economics	English			0	0
1	90449	SAFETY AND MARITIME TRANSPORT LAW	SAFETY AND MARITIME TRANSPORT LAW	5	IUS/14	CORE ACTIVITY	Law and Economics	English		The module aims at introducing international, EU and national directives, regulations and technical standards related to safety implementation, certification, and control in the transport sector. More in details, the module takes maritime transport as a model case of safety regulation in transport and aims at providing the basic concepts of safety legislations and certification in order to provide the necessary instruments to understand, implement and manage safety systems/models in accordance with present legal framework. Moreover, the course highlights relationship between safety and responsibility in maritime casualties.	40	85
1	90450	EUROPEAN UNION LAW AND TRANSPORT POLICY	EUROPEAN UNION LAW AND TRANSPORT POLICY	5	IUS/14	CORE ACTIVITY	Law and Economics	English		The module aims at providing to students the essential research and analysis tools in the field of EU (and international) transport law by studying, on the one hand, the specificities of the Union, its sources of law and relationships with domestic law, and, on the other, the relevant legal framework and policy in transport matters (maritime, air, road, and rail transport), highlighting common and divergent marks between the	40	85

										different fields, and their impact on safety, access - and management - of infrastructures, and access to the market.		
1	90451	TELECOMMUNICATIONS FOR TRANSPORT SYSTEMS	TELECOMMUNICATIONS FOR TRANSPORT SYSTEMS	10	ING-INF/03	CORE ACTIVITY	Safety Engineering and Information Security	English			0	0
1	90452	TECHNOLOGIES FOR SAFETY, SECURITY, AND INFOMOBILITY	TECHNOLOGIES FOR SAFETY, SECURITY, AND INFOMOBILITY	5	ING-INF/03	CORE ACTIVITY	Safety Engineering and Information Security	English		The course aims at providing the basics of radio communication principles and a functional description of latest generation radio mobile systems with particular focus on their application in infomobility data management. Localization technologies are investigated and compared, both terrestrial and satellite based. Sensors technologies for traffic monitoring are described together with their application within complex system for smart mobility and transport infrastructure monitoring and management. RFID, Bluetooth, and NFC technologies are described for their use in logistics applications.	45	80
1	90453	TELECOMMUNICATIONS NETWORKS	TELECOMMUNICATIONS NETWORKS	5	ING-INF/03	CORE ACTIVITY	Safety Engineering and Information Security	English		The course aims at introducing the basics of telecommunication networks from the point of view of the transmission media, the functional structure, the definition of protocols, and the remote system communication. Elements about Internet of Things functions and protocols will be also provided considering application scenarios related to safety, intelligent transport systems and logistics. Moreover, basics of Machine Learning will be provided with examples in the mentioned application frameworks.	45	80
1	90454	SAFE INDUSTRIAL PRODUCTION PRINCIPLES	SAFE INDUSTRIAL PRODUCTION PRINCIPLES	10		CORE ACTIVITY	Safety Engineering and Industrial Security	English			0	0

1	90455	PRINCIPLES OF PRODUCTION AND INDUSTRIAL SAFETY ENGINEERING	PRINCIPLES OF PRODUCTION AND INDUSTRIAL SAFETY ENGINEERING	5	ING-IND/17	CORE ACTIVITY	Safety Engineering and Industrial Security	English		The course is aimed at studying various aspects of safety and security in industrial applications including: chemical plants, oil & gas, dangerous goods handling etc. Starting form reliability analysis, through Bayesian statistics, reliability modelling and simulation, failure analysis the course will guide the identification of possible risk factors and will presents the most promising methodological approaches. Two practical assignment will be given focusing on industrial incidents involving chemical spills and complex plants failures.	45	80
1	94850	PRODUCTION QUALITY AND SUSTAINABILITY	PRODUCTION QUALITY AND SUSTAINABILITY	5	ING-IND/17	CORE ACTIVITY	Safety Engineering and Industrial Security	English		The course is aimed at studying quality and sustainability in production units and in the technology development, design, and applications. After an initial classification of the general problem, the course will review in depth issues related to industrial production of a product used as an example and integrity control methodologies. The course topics involve activities in the areas of: innovative technologies in industrial and transports uses, environmental aspects in production, new materials development, and processes management for sustainability	45	80
1	90872	ENVIRONMENTAL MITIGATION STRATEGIES IN COASTAL AREAS	ENVIRONMENTAL MITIGATION STRATEGIES IN COASTAL AREAS	5	ICAR/02	CORE ACTIVITY	Safety Engineering and Civil, Environmental and Territorial Protection	English		The course aims at providing an overview about the environmental impact of costal infrastructures for transport logistics, and production (e.g., seaports) examining the regulations issued both at national and international level. Further, the course deals with the technical-engineering aspects of the hydraulic infrastructures in coastal areas.	45	80
1	98920	INFORMATION SYSTEMS FOR TRANSPORT AND LOGISTICS	INFORMATION SYSTEMS FOR TRANSPORT AND LOGISTICS	5	ING-INF/05	CORE ACTIVITY	Safety Engineering and Information Security	English		The course aims at providing an overview of information systems geared to transport, logistic and production systems, with reference to the main methodologies and technologies for the collection, storage, management, and analysis of data. The course will focus on basic technological components, providing methodological tools to write simple scripts and use an information system. In particular, the course will address aspects relating to the automatization of data	45	80

										management and data warehousing systems, with particular attention to the scripting methods and interrogation methods of structured text files and databases.		
2	80172	METHODS AND MODELS FOR DECISION SUPPORT	METHODS AND MODELS FOR DECISION SUPPORT	6	MAT/09	ELECTIVE ACTIVITY	Student's elective activity	English		The course aims at introducing the modelization and solution tools for complex decision problems: methods based on integer programming models, heuristics and metaheuristics for combinatorial optimization problems, the PERT method for Project Management are studied. Finally fundamental concepts for solving multi-criteria decision problems are introduced. Applications to manufacturing planning and scheduling and logistics (network flow, location and vehicle routing) will be considered.	48	102
2	90460	SEMINARS AND ORIENTATIO N	SEMINARS AND ORIENTATIO N	1		OTHER ACTIVITY	Other skills useful for entering the labour market	English		Training and Orientation is addressed at developing students' further skills in design, specific software knowledge and measurement techniques for their next professional career.	0	25
2	90461	FINAL EXAM	FINAL EXAM	15		FINAL EXAM	For the final examination	English		Master Thesis is addressed at developing students' skills in analyzing, modelling, solving and presenting the results related to engineering complex problems in transport, logistic, and production systems. Master Thesis consists in the realization of a detailed Report on given engineering topics thus enhancing the students' abilities in preparing professional reports and projects for their next professional career.	0	375
2	94848	MACHINES AND SYSTEMS FOR TRANSPORT AND LOGISTICS	MACHINES AND SYSTEMS FOR TRANSPORT AND LOGISTICS	5	ING-IND/08	RELATED OR SUPPLEME NTARY ACTIVITY	Related or supplementa ry learning activity	English		The module aims at providing the knowledge on the main types of machines, with reference to those used in transport and logistic systems, as well as on energy systems and their environmental impact. The main objectives are: to provide an adequate and critical knowledge on the main design and operating aspects of internal combustion engines and gas turbines power plants. To analyse combustion processes and pollutant emissions formation, including the relevant technologies for their control. To define criteria for the comparison of propulsion systems	45	80

										based on conventional and alternative (electric, hybrid and fuel cell) technologies.		
2	98954	METHODS AND MODELS FOR LOGISTICS	METHODS AND MODELS FOR LOGISTICS	5	ING-INF/04	CORE ACTIVITY	Safety Engineering and Information Security	English		The module aims at providing the basic elements of logistics and integrated inventory management techniques as well as to develop and to use logical-mathematical models for the analysis and the planning of logistics systems.	45	80
2	104794	RAIL AND MARITIME TRANSPORT SYSTEMS	RAIL AND MARITIME TRANSPORT SYSTEMS	10	ICAR/05	RELATED OR SUPPLEMENTARY ACTIVITY	Related or supplementary learning activity	English			0	0
2	90490	RAIL TRANSPORT	RAIL TRANSPORT	5	ICAR/05	RELATED OR SUPPLEMENTARY ACTIVITY	Related or supplementary learning activity	English		The aim of the course is to provide the basic knowledge about the characteristics of rail transport systems both from the technical and functional point of view. A focus on the relevant sustainability is also provided.	50	75
2	101884	MARITIME TRANSPORT	MARITIME TRANSPORT	5	ICAR/05	RELATED OR SUPPLEMENTARY ACTIVITY	Related or supplementary learning activity	English		The aim of the course is to provide the basic knowledge about the characteristics of maritime transport of freights and people. In particular, the course will provide the basic knowledge about ships and their life cycle, ship routes, port's characteristics and processes. In the end, the course will introduce the main models and solutions for some freight terminal operations: berth's allocation, route planning, freight loading/unloading, and yard management.	50	75
2	104795	ADVANCED TRANSPORT SYSTEMS DESIGN	ADVANCED TRANSPORT SYSTEMS DESIGN	6	ICAR/05	ELECTIVE ACTIVITY	Student's elective activity	English		The goal of the course is providing the principles of transport planning in relation to different geographic and temporal scales, the functional design of transport infrastructures and services, as well as the tools for evaluating the economic convenience and sustainability. In doing so, some relevant cases will be considered with the aim of introducing modern design techniques: OD matrix estimation and calibration, network design, public transport and car-sharing design, traffic light design.	54	96

2	104838	RESILIENT LOGISTICS AND SUPPLY CHAIN MANAGEMENT	RESILIENT LOGISTICS AND SUPPLY CHAIN MANAGEMENT	10		CORE ACTIVITY // RELATED OR SUPPLEMENTARY ACTIVITY	Safety Engineering and Industrial Security // Related or supplementary learning activity				0	0
2	90471	SUPPLY CHAIN RESILIENCY	SUPPLY CHAIN RESILIENCY	5	ING-IND/17	CORE ACTIVITY	Safety Engineering and Industrial Security	English		The module aims at providing the basics on supply chain resiliency, intended as the ability of a company to protect the continuity of supply and achieve sustained operational performance in the event of global mult-tier disruptions of any type at any frequency from ongoing to catastrophic. The course will focus particularly on SCRM 2000 and on the requirements of ISO 28000, PD 25222, and ISO 31000. Modeling and simulation will be extensively used to support quantitative scenario evaluation over multi-tier, multi-product SCM.	45	80
2	90491	SMART AND SAFE LOGISTICS	SMART AND SAFE LOGISTICS	5	ICAR/05	RELATED OR SUPPLEMENTARY ACTIVITY	Related or supplementary learning activity	English		At the end of the course, the student will be able to develop and use simulation models of complex logistic systems and to test innovative solutions to make the transport of goods smarter and safer. The student will also be able to discuss the theoretical aspects of discrete event simulation, including the input data analysis and the output data analysis.	50	75
2	106694	SUSTAINABLE RAIL AND ROAD INFRASTRUCTURE	SUSTAINABLE RAIL AND ROAD INFRASTRUCTURE	6	ICAR/05	ELECTIVE ACTIVITY	Student’s elective activity			The aim of the course is to provide knowledge regarding the design and management of rail and road infrastructure with a particular reference to the application of innovative technologies and sustainability aspects. New trends such as automation and digitalisation are addressed focusing on users’ perspective and acceptability.	48	90

Dipartimento di Ingegneria Meccanica, Energetica, Gestionale e dei Trasporti

CORSO DI LAUREA MAGISTRALE IN SAFETY ENGINEERING FOR TRANSPORT, LOGISTICS AND PRODUCTION

Classe LM 26 - Ingegneria della Sicurezza
REGOLAMENTO DIDATTICO - Coorte 2022/2024
Deliberato dal Consiglio del Corso di Studi del 02.05.2022
Parte generale

INDICE

Art. 1 Premessa e ambito di competenza

Il presente Regolamento, in conformità allo Statuto e al Regolamento Didattico di Ateneo, (parte generale e parte speciale), disciplina gli aspetti organizzativi dell'attività didattica del corso di laurea magistrale in Safety Engineering for Transport, Logistics, and Production, nonché ogni diversa materia ad esso devoluta da altre fonti legislative e regolamentari.

Il Regolamento didattico del corso di laurea magistrale in Safety Engineering for Transport, Logistics and Production è deliberato, ai sensi dell'articolo 25, commi 1 e 4 del Regolamento Didattico di Ateneo, parte generale, nel Consiglio di Corso di Studio (CCS) di Safety Engineering for Transport, Logistics and Production a maggioranza dei componenti e sottoposto all'approvazione del Consiglio di Dipartimento di Ingegneria Meccanica, Energetica, Gestionale e dei Trasporti (DIME), sentita la Scuola Politecnica, previo parere favorevole della Commissione Paritetica di Scuola.

Le delibere del CCS possono essere assunte anche in modalità telematica ai sensi dei sovraordinati regolamenti e, in particolare, dell'articolo 14 "Riunioni con modalità telematiche" del vigente Regolamento Generale di Ateneo (in vigore dal 19/12/2018).

Art. 2. Requisiti di ammissione e modalità di verifica della preparazione individuale

L'ammissione alla Laurea Magistrale in Safety Engineering for Transport, Logistics, and Production è subordinata al possesso di specifici requisiti curricolari e di adeguatezza della preparazione personale. I requisiti curricolari devono essere posseduti prima della verifica della preparazione individuale.

Requisiti Curricolari: Per l'accesso al Corso di Laurea Magistrale in Safety Engineering for Transport, Logistics, and Production sono richieste conoscenze equivalenti a quelle previste dagli obiettivi formativi generali di tutte le Lauree triennali nelle Classi di Ingegneria Civile e Ambientale, Ingegneria dell'Informazione, Ingegneria Industriale (Classi L-7, L-8 e L-9 del DM 270/2004).

Sono infatti richiesti tutti i seguenti requisiti curricolari:

- possesso di Laurea, Laurea Specialistica o Laurea Magistrale, di cui al DM 509/1999 o DM 270/2004, conseguita presso una Università italiana oppure una Laurea quinquennale (ante DM 509/1999), conseguita presso una Università italiana o titoli equivalenti;
- possesso di almeno 36 CFU, o conoscenze equivalenti, acquisiti in un qualunque corso universitario (Laurea, Laurea Specialistica, Laurea Magistrale, Master Universitari di primo e secondo livello) nei settori scientifico-disciplinari indicati per le attività formative di base delle Lauree delle Classi di Ingegneria L-7, L-8, L-9;
- possesso di almeno 45 CFU, o conoscenze equivalenti, acquisiti in un qualunque corso universitario (Laurea, Laurea Specialistica, Laurea Magistrale, Master Universitari di primo e secondo livello) nei settori scientifico disciplinari indicati per le attività formative caratterizzanti delle classi di Laurea in Ingegneria L-7, L-8, L-9;
- adeguata conoscenza della lingua inglese pari a livello B2 o equivalente.

Tutte le Lauree triennali in Ingegneria erogate dall'Università degli Studi di Genova soddisfano i requisiti curricolari richiesti dalla laurea magistrale.

Nel caso di possesso di lauree differenti da quelle sopra indicate e in caso di studenti con titolo di studio non italiano, il CCS verificherà la presenza dei requisiti curricolari o delle conoscenze equivalenti, sulla base della qualità dell'università che ha erogato il titolo, degli esami sostenuti dallo studente nel corso di laurea di provenienza, nonché la presenza di eventuali esami extracurricolari, le attività di stage e le esperienze lavorative maturate.

Verifica della preparazione individuale: Ai fini dell'ammissione al corso di laurea magistrale gli studenti in possesso dei requisiti curricolari dovranno sostenere con esito positivo una prova per la verifica della preparazione personale, salvo i casi di seguito esposti.

La prova di verifica sarà svolta sotto forma di test scritto o di colloquio pubblico e sarà finalizzata ad accertare la preparazione generale dello studente con particolare riferimento alla conoscenza di nozioni fondamentali della matematica e della fisica di base, nonché di aspetti applicativi e professionali relativi alle tematiche proprie dell'ingegneria.

Ai fini della valutazione dello studente, la Commissione d'esame tiene conto anche del curriculum ottenuto nel percorso di laurea triennale. L'esito della prova prevede la sola dicitura "superato" o "non superato". La prova è sostenuta davanti ad una Commissione nominata dal CCS e composta da docenti afferenti al CCS.

Nel bando per l'ammissione ai corsi di Laurea magistrale della Scuola Politecnica e sul sito web del corso di laurea magistrale sono indicati: la composizione della Commissione d'esame, le modalità della prova, il luogo e la data, gli argomenti oggetto d'esame, i criteri di valutazione dei candidati.

L’adeguatezza della preparazione personale è automaticamente verificata per coloro che hanno conseguito la laurea triennale italiana con una votazione finale di almeno 9/10 del voto massimo previsto dalla propria laurea.

L’adeguatezza della preparazione personale è verificata per coloro che hanno conseguito la laurea triennale non italiana, o titolo giudicato equivalente, direttamente in fase di valutazione dei requisiti curriculari e sulla base della documentazione fornita dal candidato.

Conoscenza della lingua inglese: La conoscenza della lingua inglese pari al livello B2 o superiore è verificata tramite certificazione in possesso dello studente, o, in assenza di essa, tramite superamento del test B2 erogato dal Centro Linguistico di Ateneo (CLAT UniGe). Il requisito della conoscenza linguistica è altresì soddisfatto se lo studente è in possesso di un titolo di laurea in lingua inglese, da certificarsi tramite documento ufficiale o lettera dell’università che abbia erogato tale titolo, da cui si evinca che gli studi si sono svolti in lingua inglese. Se nessuna delle precedenti condizioni è soddisfatta, la conoscenza linguistica deve essere verificata durante la prova di verifica della preparazione personale da parte dalla relativa Commissione d’esame. In quest’ultimo caso, costituisce quindi oggetto della verifica della preparazione personale anche la capacità di utilizzare fluentemente la lingua inglese.

Per gli studenti di nazionalità extra-UE, con residenza e titolo di studio esteri, la procedura di presentazione della propria candidatura ai fini della verifica dell’ammissibilità ad una LM in inglese deve passare attraverso un portale web dedicato, selezionato dall’Ateneo e adeguatamente pubblicizzato. A seguito del caricamento della documentazione nel portale viene effettuata la verifica della completezza dei documenti.

I candidati che superano la verifica dei requisiti passano alla fase successiva, relativa alla valutazione dei titoli e alla valutazione finale del candidato, a valle della quale lo studente verrà ritenuto ammissibile, ammissibile sotto condizione (attribuzione di carriere ponte) o non ammissibile.

Il numero massimo ammissibile di studenti iscritti provenienti da paesi non appartenenti all'Unione Europea viene stabilito annualmente dal CCS, comunicato al Settore Accoglienza Studenti Stranieri di Ateneo e pubblicato sul sito Universitaly.

Art. 3 Attività formative

L’elenco degli insegnamenti e delle altre attività formative attivabili nella coorte 2022/2024, è riportato nell’apposito allegato (ALL.1) che costituisce parte integrante del presente regolamento.

Per ogni insegnamento vi è un docente responsabile. È docente responsabile di un insegnamento chi ne sia titolare a norma di legge, ovvero colui al quale il Consiglio del Dipartimento di afferenza abbia attribuito la responsabilità stessa in sede di affidamento dei compiti didattici ai docenti.

La lingua usata per erogare le attività formative (lezioni, esercitazioni, laboratori) è l'inglese, ove sia espressamente deliberato dal CCS.

Art. 4 Iscrizione a singole attività formative

In conformità con l’articolo 5 del Regolamento di Ateneo per gli studenti, per iscriversi a singole attività formative occorre possedere un titolo di studio che permetta l'accesso all'Università.

Art. 5 Curricula

Il corso di Laurea Magistrale in Safety Engineering for Transport, Logistics and Production non è articolato in curricula.

Art. 6 Impegno orario complessivo

La definizione della frazione oraria dedicata a lezioni o attività didattiche equivalenti è stabilita, per ogni insegnamento, dal CCS e specificata nella parte speciale del Regolamento. In ogni caso, salvo eccezioni, si assume il seguente intervallo di variabilità della corrispondenza ore-aula/CFU: 8 ÷ 10 ore di lezione o di attività didattica assistita.

La definizione dell'impegno orario complessivo presunto, riservato allo studio personale o ad altre attività formative di tipo individuale, è stabilito, per ogni insegnamento, nell'allegato (ALL.1) del presente regolamento.

Il Direttore del Dipartimento di Ingegneria Meccanica, Energetica, Gestionale e dei Trasporti (DIME) e il Coordinatore del CCS sono incaricati di verificare il rispetto delle predette prescrizioni.

Art. 7 Piani di studio e propedeuticità

Gli studenti possono iscriversi a tempo pieno o a tempo parziale; per le due tipologie di studente sono previsti differenti diritti e doveri.

Lo studente sceglie la tipologia di iscrizione contestualmente alla presentazione del piano di studi.

Lo studente a tempo pieno svolge la propria attività formativa tenendo conto del piano di studio predisposto dal corso di laurea magistrale, distinto per anni di corso e pubblicato nel Manifesto degli studi. Il piano di studio formulato dallo studente deve contenere l'indicazione delle attività formative, con i relativi crediti che intende conseguire, previsti dal piano di studio ufficiale per tale periodo didattico, fino ad un massimo di 65 crediti previsti in ogni anno.

Lo studente a tempo parziale è tenuto a presentare un piano di studio individuale specificando il numero di crediti che intende inserire secondo quanto disposto dal regolamento per la contribuzione studentesca di Ateneo.

L'iscrizione degli studenti a tempo pieno e a tempo parziale è disciplinata dal regolamento di Ateneo per gli studenti tenuto conto delle disposizioni operative deliberate dagli Organi centrali di governo ed indicate nella Guida dello studente (pubblicata annualmente sul sito web dell'Università).

Il percorso formativo dello studente è stato organizzato secondo criteri di propedeuticità, indicate nella parte speciale del presente regolamento (Allegato 1).

Il corso di laurea, con esplicita e motivata deliberazione, può autorizzare gli studenti che nell'anno accademico precedente abbiano dimostrato un rendimento negli studi particolarmente elevato ad inserire nel proprio piano di studio un numero di crediti superiore a 65, ma in ogni caso non superiore a 75. Per "rendimento particolarmente elevato" si intende che lo studente abbia superato tutti gli esami del proprio piano di studio entro il mese di settembre.

Il piano di studio articolato su una durata più breve rispetto a quella normale è approvato dal CCS.

La modalità e il termine per la presentazione del piano di studio sono stabiliti annualmente dalla Scuola Politecnica e riportate sul sito web di Ateneo, accessibile da quello del CdS.

Art. 8 Frequenza e modalità di svolgimento delle attività didattiche

Gli insegnamenti si sviluppano in forma di: (a) lezioni, anche a distanza mediante mezzi telematici; (b) esercitazioni pratiche; (c) esercitazioni in laboratorio; (d) seminari telematici.

Il profilo articolato e la natura impegnativa delle lezioni tenute nell'ambito del corso di studio rendono la frequenza alle attività formative fortemente consigliata per una adeguata comprensione degli argomenti e quindi per una buona riuscita negli esami.

Il calendario delle lezioni è articolato in semestri. Di norma, il semestre è suddiviso in almeno 12 settimane di lezione più almeno 4 settimane complessive per prove di verifica ed esami di profitto.

Il periodo destinato agli esami di profitto termina con l'inizio delle lezioni del semestre successivo.

A metà semestre, la normale attività didattica (lezioni, esercitazioni, laboratori) può essere interrotta seguendo le indicazioni del calendario della Scuola Politecnica.

L'orario delle lezioni per l'intero anno accademico è pubblicato sul sito web di Ateneo, accessibile da quello del CdS prima dell'inizio delle lezioni dell'anno accademico. L'orario delle lezioni garantisce la possibilità di frequenza per anni di corso previsti dal vigente Manifesto degli studi.

Per ragioni pratiche non è garantita la compatibilità dell'orario per tutte le scelte formalmente possibili degli insegnamenti opzionali. Gli studenti devono quindi formulare il proprio piano di studio tenendo conto dell'orario delle lezioni.

Art. 9 Esami e altre verifiche del profitto

Gli esami di profitto possono essere svolti in forma scritta, orale, o scritta e orale, secondo le modalità indicate nelle schede di ciascun insegnamento pubblicate sul sito web di Ateneo e accessibili da quello del CdS.

A richiesta, possono essere previste specifiche modalità di verifica dell'apprendimento che tengano conto delle esigenze di studenti disabili e di studenti con disturbi specifici dell'apprendimento (D.S.A.), in conformità all'art. 20 comma 4 del Regolamento Didattico di Ateneo.

Nel caso di insegnamenti strutturati in moduli con più docenti, questi partecipano collegialmente alla valutazione complessiva del profitto dello studente che non può, comunque, essere frazionata in valutazioni separate sui singoli moduli.

Il calendario degli esami di profitto è stabilito entro la scadenza ministeriale per l'anno accademico successivo e viene pubblicato sul sito web di Ateneo, accessibile da quello del CdS.

Gli esami si svolgono nei periodi di interruzione delle lezioni. Possono essere previsti appelli durante il periodo delle lezioni soltanto per gli studenti che, nell'anno accademico in corso, non abbiano inserito attività formative nel proprio piano di studio.

Tutte le verifiche del profitto relative alle attività formative debbono essere superate dallo studente entro la scadenza prevista dalla segreteria studenti della Scuola Politecnica in vista della prova finale, come indicato nel "promemoria" pubblicato sul sito web di Ateneo e accessibile da quello del CdS.

L'esito dell'esame, con la votazione conseguita, è verbalizzato secondo quanto previsto all'art. 20 del regolamento didattico di Ateneo.

Le commissioni di esame di profitto sono nominate dal Direttore del Dipartimento o su sua delega dal Coordinatore del corso di studio e sono composte da almeno tre componenti. Ad ogni sessione di esame saranno presenti almeno due membri. Il docente responsabile dell'insegnamento è membro con funzione di presidente. Possono essere componenti della Commissione cultori della materia individuati dal consiglio del corso di studio sulla base di criteri che assicurino il possesso di requisiti scientifici, didattici o professionali; tali requisiti si possono presumere posseduti da parte di docenti universitari a riposo. Per ogni Commissione all'atto di nomina va individuato almeno un presidente supplente. In ogni sessione di esame le commissioni sono presiedute dal presidente o da un supplente.

Art. 10 Riconoscimento di crediti

Il corso di laurea delibera sull'approvazione delle domande di passaggio o trasferimento da un altro corso di laurea dell'Ateneo o di altre Università secondo le norme previste dal Regolamento didattico di Ateneo, art. 18. Delibera altresì il riconoscimento, quale credito formativo, per un numero massimo di 12 CFU, di conoscenze e abilità professionali certificate ai sensi della normativa vigente.

Nella valutazione delle domande di passaggio si terrà conto delle specificità didattiche e dell'attualità dei contenuti formativi dei singoli esami sostenuti, riservandosi di stabilire di volta in volta eventuali forme di verifica ed esami integrativi.

Nel quadro della normativa nazionale e regionale su alternanza formazione/lavoro (es. tirocinio, attività lavorativa…), è possibile per il corso di studio prevedere, per studenti selezionati, percorsi di apprendimento che tengano conto anche di esperienze lavorative svolte presso aziende convenzionate.

Art. 11 Mobilità, studi compiuti all'estero, scambi internazionali

Il CCS incoraggia fortemente le attività di internazionalizzazione, in particolare la partecipazione degli studenti ai programmi di mobilità e di scambi internazionali. A tal fine garantisce, secondo le modalità previste dalle norme vigenti, il riconoscimento dei crediti formativi conseguiti all'interno di tali programmi, e organizza le attività didattiche opportunamente in modo da rendere agevoli ed efficaci tali attività.

Il CCS riconosce agli studenti iscritti, che abbiano regolarmente svolto e completato un periodo di studi all'estero, gli esami sostenuti fuori sede e il conseguimento dei relativi crediti che lo studente intenda sostituire ad esami del proprio piano di studi.

Ai fini dei riconoscimenti di tali esami, lo studente, all'atto della compilazione del piano delle attività formative che intende seguire all'estero, dovrà produrre idonea documentazione comprovante l'equivalenza dei contenuti tra l'insegnamento impartito all'estero e l'insegnamento che intende sostituire, impartito nel corso di laurea magistrale in Safety Engineering for Transport, Logistics, and Production. L'equivalenza è valutata dal CCS. La conversione dei voti avverrà secondo criteri approvati dal CCS, congruenti con il sistema europeo ECTS.

Per periodi di studio dedicati alla preparazione della prova finale, il numero di crediti riconosciuto, relativi a tale fattispecie, è messo in relazione alla durata del periodo svolto all'estero.

Art. 12 Modalità della prova finale e conoscenza della lingua straniera

La prova finale consiste nella presentazione e discussione di un elaborato scritto, di fronte ad apposita Commissione, tendente ad accertare la preparazione tecnico-scientifica e professionale del candidato. Ai fini del conseguimento della laurea magistrale, l'elaborato finale consiste nella redazione di una tesi, elaborata dallo studente in modo originale sotto la guida di uno o più relatori, su un argomento definito attinente agli obiettivi formativi del Corso di Studio.

In ogni caso tra i relatori deve essere presente almeno un docente della Scuola Politecnica o del CdS.

La tesi deve essere redatta in lingua inglese. In caso di utilizzo di altra lingua della UE è necessaria l'autorizzazione del CCS.

La tesi dovrà rivelare le capacità dello studente nell'affrontare tematiche di ricerca e/o di tipo applicativo. La tesi dovrà essere costituita da un progetto e/o dallo sviluppo di un'applicazione che proponga soluzioni innovative rispetto allo stato dell'arte e dimostri le capacità di analisi e di progetto dello studente.

La tesi di laurea può avere natura sperimentale, numerica o teorica ed essere eventualmente svolta presso aziende od enti esterni, pubblici o privati.

La tesi dovrà altresì rivelare:

- capacità di affrontare problemi complessi con approccio multidisciplinare
- corretto uso delle fonti e della bibliografia;
- capacità sistematiche e argomentative;
- chiarezza nell'esposizione;

- capacità progettuale e sperimentale;
- capacità critica.

La Commissione per la prova finale è composta da almeno cinque componenti compreso il Presidente ed è nominata dal Direttore del dipartimento di Ingegneria Meccanica, Energetica, Gestionale e dei Trasporti.

Le modalità di svolgimento della prova finale consistono nella presentazione orale della tesi di laurea da parte dello studente alla Commissione per la prova finale, seguita da una discussione sulle questioni eventualmente poste dai membri della Commissione.

La valutazione della prova finale da parte della Commissione avviene, in caso di superamento della stessa, attribuendo un incremento, variabile da 0 a 6, alla media ponderata dei voti riportati nelle prove di verifica relative ad attività formative che prevedono una votazione finale, assumendo come peso il numero di crediti associati alla singola attività formativa.

L'incremento risulta dalla somma di due elementi:

1. valutazione della carriera dello studente inclusi i periodi di studio all'estero (fino a 1 punto);
2. valutazione del lavoro di tesi (fino a 4 punti);
3. valutazione della prova finale e della relativa esposizione (fino a 1 punto).

Può inoltre essere attribuita la dignità di stampa a tesi per le quali sia stato inviato alla Commissione, almeno una settimana prima della laurea, un articolo in formato camera-ready, con indicazione del convegno o della rivista al quale è stato o verrà sottomesso.

Art. 13 Orientamento e tutorato

La Scuola Politecnica, di concerto con il Dipartimento di Ingegneria Meccanica, Energetica, Gestionale e dei Trasporti, organizza e gestisce un servizio di orientamento e il sostegno degli studenti, al fine di prevenire la dispersione e il ritardo negli studi e di promuovere una proficua partecipazione attiva alla vita universitaria in tutte le sue forme.

Art. 14 Verifica dell'obsolescenza dei crediti

I crediti formativi universitari acquisiti nell'ambito del corso di laurea possono essere sottoposti a verifica di obsolescenza dopo sei anni. Qualora il CCS riconosca l'obsolescenza anche di una sola parte dei relativi contenuti formativi, lo stesso CCS stabilisce le prove integrative che dovranno essere sostenute dallo studente, definendo gli argomenti delle stesse, le modalità di verifica, la composizione della Commissione di esame.

Una volta superate le verifiche previste, il CCS convalida i crediti acquisiti con apposita delibera. Qualora la relativa attività formativa preveda una votazione, la stessa potrà essere variata rispetto a quella precedentemente ottenuta, su proposta della Commissione d'esame che ha proceduto alla verifica.

Art. 15 Manifesto degli Studi

Il Dipartimento di Ingegneria Meccanica, Energetica, Gestionale e dei Trasporti, sentita la Scuola, approva e pubblica annualmente il Manifesto degli studi sul sito web di Ateneo, accessibile da quello del CdS. Nel Manifesto sono indicate le principali disposizioni dell'ordinamento didattico e del regolamento didattico del corso di laurea, a cui eventualmente si aggiungono indicazioni integrative.

Il Manifesto degli studi del corso di laurea magistrale contiene l'elenco degli insegnamenti attivati per l'anno accademico in questione. Le schede dei singoli insegnamenti sono pubblicate sul sito web di Ateneo e sono accessibili da quello del CdS.

Allegato 1 Parte speciale del Regolamento didattico del Corso di Laurea Magistrale in Safety Engineering for Transport, Logistics and Production della Scuola Politecnica

Elenco delle attività formative attivabili e relativi obiettivi formativi

DIDATTICA PROGRAMMATA A.A. 2022/2023
REGOLAMENTO DIDATTICO PARTE SPECIALE COORTE 2022/2023
10377 SAFETY ENGINEERING FOR TRANSPORT, LOGISTICS, AND PRODUCTION LM-26 GE

Anno di corso	Codice	Nome insegnamento ITA	Nome insegnamento ENG	CFU	SSD	Tipologia	Ambito	Lingua	Propedeuticità	Obiettivi formativi	Ore riservate alla didattica assistita	Ore riservate allo studio personale
1	90442	OPTIMIZATION AND CONTROL OF TRANSPORT AND LOGISTICS	OPTIMIZATION AND CONTROL OF TRANSPORT AND LOGISTICS	10	ING-INF/04	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese			0	0
1	90443	OPTIMIZATION AND CONTROL METHODS	OPTIMIZATION AND CONTROL METHODS	5	ING-INF/04	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese		The goal is that of making the students achieve the capacity modeling dynamic systems and solving control problems involving the optimization of some performance index.	45	80
1	90444	MODELLING AND CONTROL OF TRAFFIC SYSTEMS	MODELLING AND CONTROL OF TRAFFIC SYSTEMS	5	ING-INF/04	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese		The goal of this course is that of developing and applying modeling and optimization tools to solve problems dealing with performance analysis and optimization of traffic networks. Different classes of dynamic models of traffic networks will be presented, based on various assumptions about the architecture for information exchange among the decision makers. Real time control problems are considered and possible control schemes are presented. The application of such schemes is discussed also with respect to the computational requirements and the needs for communication.	45	80
1	90445	TRANSPORT SYSTEMS ENGINEERING	TRANSPORT SYSTEMS ENGINEERING	12	ICAR/05	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese			0	0
1	90446	TRANSPORT SYSTEMS PLANNING	TRANSPORT SYSTEMS PLANNING	6	ICAR/05	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese		The goal of the course is providing the basic analytical tools for the study of transport systems, including: supply models of transport infrastructures and services, probability theory and random choice, behavioural and non-behavioural	54	96

										demand models, and assignment models and algorithms both with optimization and fixed-point approaches. All the topics will be faced from the point of view of theory and applications.		
1	101499	SAFE AND RELIABLE TRANSPORT SYSTEMS	SAFE AND RELIABLE TRANSPORT SYSTEMS	6	ICAR/05	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese		At the end of the course, the student will be able to describe and discuss combinatorial methods and state-based approaches for the assessment of safety and security aspects in the context of transport and logistic systems. In particular, the student will be able to create models for safety and reliability assessment based on Fault Tree Analysis, Event Tree Analysis, Bayesian networks, Petri nets and Markov chains.	54	96
1	90448	TRANSPORT SAFETY LAW	TRANSPORT SAFETY LAW	10	IUS/14	CARATTERIZZANTI	Ambito Giuridico-Economico	Inglese			0	0
1	90449	SAFETY AND MARITIME TRANSPORT LAW	SAFETY AND MARITIME TRANSPORT LAW	5	IUS/14	CARATTERIZZANTI	Ambito Giuridico-Economico	Inglese		The module aims at introducing international, EU and national directives, regulations and technical standards related to safety implementation, certification, and control in the transport sector. More in details, the module takes maritime transport as a model case of safety regulation in transport and aims at providing the basic concepts of safety legislations and certification in order to provide the necessary instruments to understand, implement and manage safety systems/models in accordance with present legal framework. Moreover, the course highlights relationship between safety and responsibility in maritime casualties.	40	85
1	90450	EUROPEAN UNION LAW AND TRANSPORT POLICY	EUROPEAN UNION LAW AND TRANSPORT POLICY	5	IUS/14	CARATTERIZZANTI	Ambito Giuridico-Economico	Inglese		The module aims at providing to students the essential research and analysis tools in the field of EU (and international) transport law by studying, on the one hand, the specificities of the Union, its sources of law and relationships with domestic law, and, on the other, the relevant legal framework and policy in transport matters (maritime, air, road, and rail transport), highlighting common and divergent marks between the different fields, and their impact on safety, access -	40	85

										and management - of infrastructures, and access to the market.		
1	90451	TELECOMMUNICATIONS FOR TRANSPORT SYSTEMS	TELECOMMUNICATIONS FOR TRANSPORT SYSTEMS	10	ING-INF/03	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese			0	0
1	90452	TECHNOLOGIES FOR SAFETY, SECURITY, AND INFOMOBILITY	TECHNOLOGIES FOR SAFETY, SECURITY, AND INFOMOBILITY	5	ING-INF/03	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese		The course aims at providing the basics of radio communication principles and a functional description of latest generation radio mobile systems with particular focus on their application in infomobility data management. Localization technologies are investigated and compared, both terrestrial and satellite based. Sensors technologies for traffic monitoring are described together with their application within complex system for smart mobility and transport infrastructure monitoring and management. RFID, Bluetooth, and NFC technologies are described for their use in logistics applications.	45	80
1	90453	TELECOMMUNICATIONS NETWORKS	TELECOMMUNICATIONS NETWORKS	5	ING-INF/03	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese		The course aims at introducing the basics of telecommunication networks from the point of view of the transmission media, the functional structure, the definition of protocols, and the remote system communication. Elements about Internet of Things functions and protocols will be also provided considering application scenarios related to safety, intelligent transport systems and logistics. Moreover, basics of Machine Learning will be provided with examples in the mentioned application frameworks.	45	80
1	90454	SAFE INDUSTRIAL PRODUCTION PRINCIPLES	SAFE INDUSTRIAL PRODUCTION PRINCIPLES	10		CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione Industriale	Inglese			0	0

1	90455	PRINCIPLES OF PRODUCTION AND INDUSTRIAL SAFETY ENGINEERING	PRINCIPLES OF PRODUCTION AND INDUSTRIAL SAFETY ENGINEERING	5	ING-IND/17	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione Industriale	Inglese		The course is aimed at studying various aspects of safety and security in industrial applications including: chemical plants, oil & gas, dangerous goods handling etc. Starting form reliability analysis, through Bayesian statistics, reliability modelling and simulation, failure analysis the course will guide the identification of possible risk factors and will presents the most promising methodological approaches. Two practical assignment will be given focusing on industrial incidents involving chemical spills and complex plants failures.	45	80
1	94850	PRODUCTION QUALITY AND SUSTAINABILITY	PRODUCTION QUALITY AND SUSTAINABILITY	5	ING-IND/17	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione Industriale	Inglese		The course is aimed at studying quality and sustainability in production units and in the technology development, design, and applications. After an initial classification of the general problem, the course will review in depth issues related to industrial production of a product used as an example and integrity control methodologies. The course topics involve activities in the areas of: innovative technologies in industrial and transports uses, environmental aspects in production, new materials development, and processes management for sustainability	45	80
1	90872	ENVIRONMENTAL MITIGATION STRATEGIES IN COASTAL AREAS	ENVIRONMENTAL MITIGATION STRATEGIES IN COASTAL AREAS	5	ICAR/02	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione Civile, Ambientale e del Territorio	Inglese		The course aims at providing an overview about the environmental impact of costal infrastructures for transport logistics, and production (e.g., seaports) examining the regulations issued both at national and international level. Further, the course deals with the technical-engineering aspects of the hydraulic infrastructures in coastal areas.	45	80
1	98920	INFORMATION SYSTEMS FOR TRANSPORT AND LOGISTICS	INFORMATION SYSTEMS FOR TRANSPORT AND LOGISTICS	5	ING-INF/05	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese		The course aims at providing an overview of information systems geared to transport, logistic and production systems, with reference to the main methodologies and technologies for the collection, storage, management, and analysis of data. The course will focus on basic technological components, providing methodological tools to write simple scripts and use an information system. In particular, the course will address aspects relating to the automatization of data management and data warehousing systems, with particular attention to the scripting methods and	45	80

										interrogation methods of structured text files and databases.		
2	80172	METHODS AND MODELS FOR DECISION SUPPORT	METHODS AND MODELS FOR DECISION SUPPORT	6	MAT/09	A SCELTA	A Scelta dello Studente	Inglese		The course aims at introducing the modelization and solution tools for complex decision problems: methods based on integer programming models, heuristics and metaheuristics for combinatorial optimization problems, the PERT method for Project Management are studied. Finally fundamental concepts for solving multi-criteria decision problems are introduced. Applications to manufacturing planning and scheduling and logistics (network flow, location and vehicle routing) will be considered.	48	102
2	90460	SEMINARS AND ORIENTATION	SEMINARS AND ORIENTATION	1		ALTRE ATTIVITA'	Altre Conoscenze Utili per l'Inserimento Nel Mondo del Lavoro	Inglese		Training and Orientation is addressed at developing students' further skills in design, specific software knowledge and measurement techniques for their next professional career.	0	25
2	90461	FINAL EXAM	FINAL EXAM	15		PROVA FINALE	Per la Prova Finale	Inglese		Master Thesis is addressed at developing students' skills in analyzing, modelling, solving and presenting the results related to engineering complex problems in transport, logistic, and production systems. Master Thesis consists in the realization of a detailed Report on given engineering topics thus enhancing the students' abilities in preparing professional reports and projects for their next professional career.	0	375
2	94848	MACHINES AND SYSTEMS FOR TRANSPORT AND LOGISTICS	MACHINES AND SYSTEMS FOR TRANSPORT AND LOGISTICS	5	ING-IND/08	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese		The module aims at providing the knowledge on the main types of machines, with reference to those used in transport and logistic systems, as well as on energy systems and their environmental impact. The main objectives are: to provide an adequate and critical knowledge on the main design and operating aspects of internal combustion engines and gas turbines power plants. To analyse combustion processes and pollutant emissions formation, including the relevant technologies for their control. To define criteria for the comparison of propulsion systems	45	80

										based on conventional and alternative (electric, hybrid and fuel cell) technologies.		
2	98954	METHODS AND MODELS FOR LOGISTICS	METHODS AND MODELS FOR LOGISTICS	5	ING-INF/04	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione dell'Informazione	Inglese		The module aims at providing the basic elements of logistics and integrated inventory management techniques as well as to develop and to use logical-mathematical models for the analysis and the planning of logistics systems.	45	80
2	104794	RAIL AND MARITIME TRANSPORT SYSTEMS	RAIL AND MARITIME TRANSPORT SYSTEMS	10	ICAR/05	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese			0	0
2	90490	RAIL TRANSPORT	RAIL TRANSPORT	5	ICAR/05	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese		The aim of the course is to provide the basic knowledge about the characteristics of rail transport systems both from the technical and functional point of view. A focus on the relevant sustainability is also provided.	50	75
2	101884	MARITIME TRANSPORT	MARITIME TRANSPORT	5	ICAR/05	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese		The aim of the course is to provide the basic knowledge about the characteristics of maritime transport of freights and people. In particular, the course will provide the basic knowledge about ships and their life cycle, ship routes, port's characteristics and processes. In the end, the course will introduce the main models and solutions for some freight terminal operations: berth's allocation, route planning, freight loading/unloading, and yard management.	50	75
2	104795	ADVANCED TRANSPORT SYSTEMS DESIGN	ADVANCED TRANSPORT SYSTEMS DESIGN	6	ICAR/05	A SCELTA	A Scelta dello Studente	Inglese		The goal of the course is providing the principles of transport planning in relation to different geographic and temporal scales, the functional design of transport infrastructures and services, as well as the tools for evaluating the economic convenience and sustainability. In doing so, some relevant cases will be considered with the aim of introducing modern design techniques: OD matrix estimation and calibration, network design, public transport and car-sharing design, traffic light design.	54	96

2	104838	RESILIENT LOGISTICS AND SUPPLY CHAIN MANAGEMENT	RESILIENT LOGISTICS AND SUPPLY CHAIN MANAGEMENT	10		CARATTERIZZANTI // AFFINI O INTEGRATIVE	Ingegneria della Sicurezza e Protezione Industriale // Attività Formative Affini o Integrative				0	0
2	90471	SUPPLY CHAIN RESILIENCY	SUPPLY CHAIN RESILIENCY	5	ING-IND/17	CARATTERIZZANTI	Ingegneria della Sicurezza e Protezione Industriale	Inglese		The module aims at providing the basics on supply chain resiliency, intended as the ability of a company to protect the continuity of supply and achieve sustained operational performance in the event of global mult-tier disruptions of any type at any frequency from ongoing to catastrophic. The course will focus particularly on SCRM 2000 and on the requirements of ISO 28000, PD 25222, and ISO 31000. Modeling and simulation will be extensively used to support quantitative scenario evaluation over multi-tier, multi-product SCM.	45	80
2	90491	SMART AND SAFE LOGISTICS	SMART AND SAFE LOGISTICS	5	ICAR/05	AFFINI O INTEGRATIVE	Attività Formative Affini o Integrative	Inglese		At the end of the course, the student will be able to develop and use simulation models of complex logistic systems and to test innovative solutions to make the transport of goods smarter and safer. The student will also be able to discuss the theoretical aspects of discrete event simulation, including the input data analysis and the output data analysis.	50	75
2	106694	SUSTAINABLE RAIL AND ROAD INFRASTRUCTURE	SUSTAINABLE RAIL AND ROAD INFRASTRUCTURE	6	ICAR/05	A SCELTA	A Scelta dello Studente	Inglese		The aim of the course is to provide knowledge regarding the design and management of rail and road infrastructure with a particular reference to the application of innovative technologies and sustainability aspects. New trends such as automation and digitalisation are addressed focusing on users' perspective and acceptability.	48	90