

**Polytechnic School - Department of Naval, Electrical, Electronic and Telecommunications  
Engineering (DITEN)  
Bachelor's degree in Maritime Science and Technology  
Class L-28  
Degree Regulation**

**Description of the Degree Course**

**Art. 1 Premise and area of competence**

This Regulation, in accordance with the Statute and the University Degree Regulation (general part and special part), discipline the organisational aspects of the teaching activity of the Bachelor Course in Maritime Sciences and Technology, as well as any other subject devolved to it by other legislative and regulatory sources.

The Degree Regulation of the Bachelor Course in Maritime Science and Technology is deliberated, according to Article 18, paragraphs 3 and 4 of the University Degree Regulation, general part, by the Degree Programme Board (DPB) of Maritime Science and Technology with the majority of the members and subjected to the approval of the DITEN Department Board (and of the Board of the associated DIEC Department), after consultation with the Polytechnic School, subject to the favourable opinion of the Joint Committee of the School.

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

**Art. 2 Admission requirements and methods of verification of initial preparation**

The Bachelor Course has restricted access in accordance with the boarding availability for Cadets Officers and with the training facilities available (certified laboratories).

The Bachelor Course has as preferential access requirement the qualification of Cadet Officer. Compatibly with the training facilities and requests, it is expected to be able to accept also a number of students without the qualification of Cadet Officer, not interested in boarding as internship. The admission to the Degree Course in Maritime Science and Technology is regulated by a specific notice of admission which is published by the University of Genoa. In the notice will be defined the exams and titles that will be evaluated for the purposes of the final ranking.

In order to enroll in the Bachelor's Degree in Maritime Science and Technology you must have a high school diploma or other qualification obtained abroad, recognized as suitable. It is also required:

- to pass an admission test which consists of a test taking place in accordance with locally established dates and procedures and which constitutes a verification of initial knowledge. The results of the admission test and the titles lead to the definition of a ranking that indicates the students who are entitled to access within the scheduled student number, as indicated in the Rector's specific notice;
- to possess or acquire the adequate initial preparation related to the specific objectives of the course of study.

The student who, being in the ranking within the scheduled number, has reported in the admission test scores lower than the minimum indicated in the Admission Notice regarding the initial knowledge, can enrol with an training debt corresponding to additional training requirements (OFA).

The Polytechnic School organizes activities to recover initial knowledge for students with OFA debt. OFA debts are considered satisfied when the student acquires the expected ECTS by passing the teaching exam of Physics or a module of the official teaching exam of Mathematics and Algebra. All students with a qualification obtained abroad will also undergo a specific test of knowledge of Italian language. The failure of this test involves the assignment of additional training requirements.

### **Art. 3 Teaching activities**

The list of s and other possible training activities, in the cohort 2020-2023, is given in the appropriate annex (Annex 1) which constitutes an integral part of this regulation. A responsible professor is identified for each teaching unit. A professor is responsible for teaching whoever is in charge of teaching according to the law, i.e. the one to whom the relative Department Board has attributed the responsibility itself when assigning teaching tasks to professors.

The language used to provide teaching ~~and~~ activities (lectures, exercises, workshops) shall be English or another EU language, where expressly decided by the DPB. Annex 1 to this regulation specifies the language in which each activity is carried out.

### **Art. 4 Enrolment in specific training activities**

In accordance with Article 6 of the University Regulations for students, in order to enrol only in specific teaching/training activities you must have a qualification which allows to access the University.

Considering the characteristics of the theoretical-practical training organization, applications for enrolling to individual training activities related to the Degree Course can only be accepted after evaluation of the DPB, necessary for the proper conduct of the courses themselves.

For the enrolment to individual training activities, the student must submit, before the beginning of the activities, a reasoned request to the Student Secretariat that will transmit it to the DPB, that will decide on it.

### **Art. 5 Curricula**

The Bachelor Course in Maritime Science and Technology is structured in curricula.

### **Art. 6 Total time commitment**

The definition of the hourly fraction dedicated to lectures or equivalent teaching activities is established, for each teaching unit, by the DPB and specified in the special part of the regulation. In any case the following intervals of variability of the correspondence classroom/ECTS hours are assumed:  $8 \div 12$  hours of lectures or assisted teaching activity for each ECTS.

The definition of the overall assumed total time commitment, reserved for personal study or other training activities of an individual type, is established, for each teaching unit, in the annex (Annex 1) to this regulation.

The Director of the DITEN Department and the Coordinator of the DPB are responsible for verifying compliance with the above requirements, including the publication of the course programmes.

### **Art. 7 Study plan and prerequisites**

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

The student chooses the type of registration simultaneously with the presentation of the study plan. The full-time student carries out his/her teaching/training activities considering the study plan prepared by the Degree Course, distinguished by years of course and published in the Degree Programme Table. The study plan submitted by the student must contain the indication of the teaching and training activities, with the relative credits that he/she intends to achieve, provided by the official study plan for the teaching period, up to a maximum of 65 credits provided in each year.

The part-time student is required to submit an individual study plan specifying the number of credits he/she intends to define.

In the absence of the completion of the study plan by the due date, a standard plan will be uploaded ex officio, except in cases where it is planned to complete an individual study plan (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 University Regulations for students considering the operational provisions resolved by the Central government bodies and indicated in the Student Guide (published annually on the University's website). The educational path of the student is organized according to criteria of propedeuticity. Therefore, the study plan is strongly recommended in line with the training path.

The DPB may, by express and reasoned resolution, authorise students who have demonstrated particularly high academic performance in the previous academic year to include in their study plan more than 65 credits, but in any case, not more than 75.

"Particularly high performance" means that the student has passed all the exams of his/her study plan by the month of September.

The study plan, which has a shorter duration than the normal one, is approved by both the Degree Programme Board and the Board of the Department.

The procedure and deadline for the submission of the study plan are established each year by the Polytechnic School and reported in the Programme Table of the Polytechnic School – Engineering Area. The student who has followed all the teaching units of his/her educational path, in case of debt equal to or less than 30 ECTS, can add in his/her study plan “extracurricular” teaching units up to a maximum of 12 ECTS, without paying additional contributions.

These teaching units are not taken into account for the purpose of obtaining the Degree but may be evaluated for the achievement of a further degree.

#### **Art. 8 Attendance and methods of carrying out teaching activities**

The teaching units may take the form of: (a) lectures, including distance learning by telematic means; (b) practical exercises; (C) laboratory exercises.

The articulated profile and the demanding nature of the lessons taught in the various Courses offered make the attendance to the teaching and training activities strongly recommended for an adequate understanding of the topics and therefore for a positive evaluation in the exams.

The lessons schedule is divided into two semesters. As a rule, the semester is divided into at least 12 weeks of teaching activities plus at least 4 weeks for verification tests and exams.

The exam period ends with the beginning of the teaching activities of the following semester. In the middle of the semester, the normal teaching activity (lectures, exercises, laboratories) can be interrupted for the final examinations, intermediate tests, seminars, tutoring activities and didactic activities of recovery.

The lessons schedule (timetable) for the entire academic year is published on the Degree Course website before the start of the lessons of the academic year. The lessons schedule guarantees the possibility of attendance based on the year of the course programme provided by the current Degree Programme Table. For practical reasons, the compatibility of the timetable for all formally possible optional teaching choices is not guaranteed. Students must then formulate their study plan taking into account the timetable of the lessons.

#### **Art. 9 Examinations and other exams**

Exams can be carried out in written, oral, or written and oral, according to the achievement methods indicated in the sheets of each teaching unit published on the website of the Degree Course.

On request, specific learning verification arrangements may be provided for taking into account the needs of disabled students and students with specific learning disorders (S.L.D.)

(Italian D.S.A.), in accordance with art. 29 paragraph 4 of the University Degree Regulation.

In the case of teaching units structured in modules taken by different teachers they participate collegially in the overall evaluation of the student's profit which cannot, however, be split into separate evaluations on the individual modules.

The calendar of exams is established by October 30th for the following academic year and is published on the website of the Degree Course. The calendar of any intermediate verification tests is established by the DPB and communicated to the students at the beginning of each teaching semester. Exams are held in the periods of interruption of the teaching activities. Exams may be planned during the teaching period only for students who, have not included teaching/training activities in their study plan, in the current academic year

All profit examinations of teaching/training activities must be passed by the students at least twenty days before the expected date of the final examination to get the degree.

The result of the exams passed, with the mark/score obtained, is registered in accordance with art. 29 of the University Degree Regulation.

Profit examination Committees are appointed by the Director of the Department or by the delegated coordinator of the DPB and are composed of at least 3 components. At least 2 members will be present at each examination session. The professor responsible for the teaching unit is a member acting as Committee president. If the percentage of passing for the teaching unit is less than 30% consecutively for two academic years, the Committee will be extended to at least 5 professors and the report must certify the actual presence of at least 3 members. Members of the Committee may also be experts identified by the Degree Programme Board on the basis of criteria ensuring the possession of scientific, training or professional requirements; such requirements may be presumed to be possessed by retired university professors. A deputy president shall be appointed for each Committee at the time of appointment. In each examination session, the Committee shall be chaired by the Committee president or by his deputy.

#### **Art. 10 Recognition of credits**

The DPB is in charge for the approval of applications for change or transfer from another Degree Course of the University or other Universities in accordance with the rules provided for in the University Degree Regulation, art. 21.

The DPB is also in charge for the evaluation and eventually recognition, as training credits, of professional knowledge and skills certified in accordance with the current legislation, for a maximum number of 12 ECTS.

In the evaluation of applications for change and transfer will be taken into account the didactic specificities and the actuality of the educational content of the individual exams taken, reserving the right to establish from time to time possible forms of verification and supplementary exams.

Within the framework of national and regional regulations on alternation of education/work, it is possible for the DPB to provide, for selected students, learning paths that also consider work experience carried out at companies under contract.

#### **Art. 11 Mobility, studies abroad, international exchanges**

The DPB strongly encourages internationalisation activities, in particular student participation in mobility and international exchange programmes. For this purpose, in accordance with the rules in force, the academic credits earned abroad within these programmes will count for the qualification of the student.

For the purposes of the recognition of the credits earned abroad, the student must submit to DPB suitable documentation proving the equivalence of content between the teaching unit abroad and the teaching unit in the Degree Course in Maritime Science and Technology. Equivalence shall be evaluated by the DPB.

The marks of the passed exams will be converted in the Italian grading system according to criteria approved by the DPB, in accordance with the European ECTS system.

Any period of study abroad, that has involved recognition of teaching/training credits, will be evaluated for the final examination.

### **Art. 12 Procedures of the final examination and knowledge of the foreign language**

In order to obtain the Bachelor Degree, the final thesis consists of a written report on a specific activity carried out by the student, under the guidance of one or more supervisors, in order to gain valuable knowledge for the profession or for the continuation of studies. The supervisors must include at least one professor from the Polytechnic School and/or from the Associate Department.

The final thesis shall be written in English; in case of use of another EU language the authorisation of the DPB is required. In such cases, the final thesis must be accompanied by the title and an extensive summary in English.

In all cases, the final thesis should reveal:

- proper basic preparation;
- adequate preparation related to the operational and management aspects of the ship;
- correct use of scientific sources and bibliography;
- argumentative skills;
- clarity of exposition.

The commitment required by the student for the preparation of the final examination commensurate with the number of credits assigned to the exam itself.

The Committee for the final examination consists of at least five members including the Committee President and is appointed by the Director of the DITEN Department.

The evaluation of the final examination by the Committee, in the event of passing it, attributes an increase, variable from 0 to 8, the maximum established by the Polytechnic School in agreement with the Departments, to the weighted average (in one hundred and tenths) of the marks obtained in the exams related to training activities that provide a final mark, assuming as weight the number of credits associated with the training activity.

Any period of study abroad, which has involved recognition of training credits, will result in an increase of up to 1 point to the above weighted average.

In order to obtain the degree, the student must have a minimum proficiency in English corresponding to the Level B1 of the Council of Europe. In order to acquire credits associated with English language proficiency, the student must pass the exam test organized by the Language skills development sector or exhibit the original certification for Level B1, or higher, provided by an accredited institution no more than three academic years before (i.e., for the academic year 2020/2021 certificates obtained in the academic years 2019/2020, 2018/2019 and 2017/2018 are accepted).

The list of certificates recognised as equivalent shall be established and updated periodically by the School. The Polytechnic School, in order to support students in acquiring the required linguistic competence, organizes, with the support of the Language skills development sector, training activities offered to homogeneous classes of students.

### **Art. 13 Guidance services and tutoring**

The Polytechnic School, in agreement with the DITEN Department, organizes and manages a tutoring service for the welcome and support of students, in order to prevent abandon and/or delays and to promote a profitable active participation in university life in all its forms.

The DPB identifies the number of tutors in accordance with the number of students enrolled. The names of the tutors can be found on the website of the Degree Course.

**Art. 14 Verification of obsolescence of credits**

University teaching credits (ECTS) earned within the framework of the Degree Course can be subjected to obsolescence verification after 6 years. If the DPB recognizes the obsolescence of even a single part of the relative educational content, the DPB itself establishes the supplementary tests that must be taken by the student, defining the topics, the methods of verification and the composition of the Examination Committee.

Once the required supplementary tests have been passed, the DPB validates the ECTS acquired with a resolution. If the related training activity provides for a mark, it may be varied from the one previously obtained, on a proposal from the Examination Committee which carried out the verification.

**Art. 15 Degree Programme Table**

The DITEN Department, after consulting the Polytechnic School, approves and publishes each year the Degree Programme Table. In the Degree Programme Table the regulations of the Degree Course are indicated, to which additional information may be added.

The Degree Programme Table contains the list of the teaching units activated for the academic year. The teaching sheets are published on the website of the Degree Course

**Annex 1 to the Degree Regulation of the Degree Course in Maritime Science and Technology**  
**List of training activities and related training objectives**  
**Curriculum “Deck Officer”**

Year	Code	Teaching unit	ECTS	SSD	Type	Area	Language	Prerequisites	Training objectives	Hours for assisted teaching activity	Hours for personal study
1	101116	MATHEMATICS AND ALGEBRA	12		BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science				0	0
1	101117	MATHEMATICS	6	MAT/05	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The aim of this course is to provide a practical working tool for students where rigorous Calculus is needed. The main focus is on the study of functions of one real variable (continuity, derivative, maxima/minima, integration) and a brief introduction to multivariable calculus (oriented towards finding maxima/minima). The last part of the course is oriented towards basic ordinary differential equations (for example separation of variables, linear first-order, and constant coefficients ODE).	60	90
1	101118	ALGEBRA	6	MAT/03	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The course aims to provide basic technical notions and tools on complex numbers, linear algebra and analytical geometry.	60	90
1	101119	PHYSICS	6	FIS/01	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		Understand basic physical fundamentals and the key vocabulary to describe them: kinematics, dynamics, work and energy, rotations, fluids. Develop skills in observation, interpretation, reasoning, synthesis, generalizing, predicting, and questioning as a way to learn new knowledge. Develop scientific problem solving skills, including organization of given information, identification and application of pertinent principles, quantitative solutions, interpreting results, and evaluating the validity of results. Apply conceptual understanding of the physics to general real-world situations, and recognize how and when physics methods and principles can help address problems in their future courses and then apply those methods and principles to solve new problems.	60	90

1	101120	ICT	9	ING-INF/05	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The course aims at introducing the student in the field of modern electronic methods for the management of information, related communications and basic methods of calculation. The course follows two distinct strands; the first concerns the study of the architecture of computing systems, the representation of information within them, the organization and operation of networks and of the Internet; the second teaches on the fundamentals of programming.	72	153
1	101122	OPTIMIZATION METHODS	6	MAT/09	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The Course introduces to optimization models and methods for the solution of decision problems, with particular attention to models and problems arising in Maritime. In particular the focus will be on route planning, cargo loading and stowage, flow management.	60	90
1	101123	SHIP STABILITY	9	ING-IND/01	CORE LEARNING ACTIVITY	Engineering disciplines	English		The course provides knowledge about the buoyancy and the stability of ships, both in intact and damaged conditions, with appropriate reference to relevant IMO regulations. Specific attention will be given also to some operational aspects e.g. to cargo handling and stowage.	90	135
1	101125	INTERNATIONAL MARITIME LAW	6	IUS/06	CORE LEARNING ACTIVITY	Legal disciplines	English		The aim of the course is to introduce students to the knowledge of the basic items concerning the vessels' utilization, including their safety and security, and maritime carriages of goods, through an analysis of the relevant national, international and E.C. laws and rules.	60	90
1	101142	MARITIME TRASPOT ECONOMIC	6	SECS-P/06	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		The course provides the specificities of the sector and the contribution provided to the general economic theory, the knowledge of the distinctive characteristics of the different modes of maritime transport and the forms of integration and competition, the markets in which the companies operate and the economic policy guidelines that drive International trade and sea transport.	60	90



1	101143	NAVIGATION	9	FIS/06	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The course offers a throughout understanding of the procedures that are relevant for the maritime navigation: a theoretical part allows to focus on the physics, geodesy and astronomy items related to navigation, while an operational part will focus on the methods that are necessary to carry out a reliable voyage planning and a correct execution, taking into account the use of nautical charts and publications, ship's routeing and ship's reporting systems. The position fixing will be analysed both in terms of coastal and celestial navigation considering the support provided by proper Aids to Navigation and the use and control of traditional instruments such as the magnetic and gyro compass and the marine sextant. The IAMSAR procedures are also taken into account.	90	135
2	101128	SHIP STRUCTURES AND STRENGTH	9	ING-IND/02	CORE LEARNING ACTIVITY	Engineering disciplines	English		The course aims at providing students with professional competences about fundamentals of shipbuilding and ship structures, showing typical methods and languages, i.e. structural plans and drawings, to describe the hull, its structural lay-out, its components and equipment. Various merchant ship types are presented, highlighting peculiarities of each. The course includes a description of ship structural design and analysis from a global view to construction details. The general scantling criteria of ship structures and components is also summarized with reference to rules and regulations of classification societies.	90	135
2	101129	SHIP PROPULSION	6	ING-IND/02	CORE LEARNING ACTIVITY	Engineering disciplines	English		The course will deal with the management and the operation of the propulsion plant. Plan and schedule operations: propulsive characteristics. Operation, performance assessment.	60	90
2	101130	ENGLISH	6	L-LIN/12	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		This course of scientific English enables students to gain sufficient specific knowledge in order to overcome the barrier of the English language, drawing from international scientific literature, not only for the purposes of professional updating, but also to master technical terminology in the maritime sector.	60	90
2	101144	ELECTRONIC NAVIGATION	9	ICAR/06	CORE LEARNING ACTIVITY	Engineering disciplines	English		Principles of cartography and electronic mapping. Fixing position and navigation.	90	135

2	101145	ICT 2	6	ING-INF/05	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		Concepts and essential tools for using and programming computers; an effective synthesis between learning the basic concepts of information technology and their application on shipboard.	48	102
2	101146	TELECOMMUNICATION	6	ING-INF/03	CORE LEARNING ACTIVITY	Engineering disciplines	English		The course aims at introducing the basics of telecommunications, from signals (sampling, modulation, frequency analysis) to computer networks (transmission media and network protocols). At the end of the course, emphasis will be given to some of the main telecommunication systems usually present onboard by analysing the technology behind RADAR, SONAR and GPS.	60	90
2	101147	SHIP MANAGEMENT	6	SECS-P/08	CORE LEARNING ACTIVITY	Economic and Corporate Disciplines	English		The course, paving on a managerial approach, aims to analyse the operations and strategies of firms operating in maritime sectors. The course focuses on main theoretical concepts and perspectives related to transport demand and segmentation, transport capacity deployment and management, marketing, as well as competitive and growth strategies. Emphasis will be given to multinational corporations operating in the transport sectors, diversifying risk and their business portfolio.	48	102
2	101148	OCEAN SCIENCE AND ENGINEERING	6	ICAR/02	CORE LEARNING ACTIVITY	Engineering disciplines	English		The aim of the course is to introduce the fundamentals of atmosphere and ocean dynamics that characterize meteocean conditions and climate from synoptic scale to the regional scales. Knowledge will be provided about synoptic charts and weather forecasting, ocean current systems and tides, wave storms and their generations, availability of data.	60	90
2	101149	SHIP MANOEUVRABILITY	6	ING-IND/01	CORE LEARNING ACTIVITY	Engineering disciplines	English		Definition of the basic motion equations and of the hydrodynamic characteristics which affect the ship behaviour in terms of manoeuvrability. Current IMO requirements will be presented, together with the standard manoeuvres adopted for the assessment of ship manoeuvrability.	60	90

3	101135	LEADERSHIP & TEAMWORKING	6	SECS-P/10	CORE LEARNING ACTIVITY	Economic and Corporate Disciplines	English		Ability to apply task and workload management. Shipboard personnel management. International conventions. Decision making techniques.	60	90
3	101136	TRAINING ON BOARD	30		FOR STAGES AND INTERNSHIPS	For Stages and Internships in Companies, Public or Private Institutions, Professional Associations	English		The curricular internship has the objective of including the student in a specific working reality of enbarquement or in industry in maritime sector.	0	750
3	101137	FINAL EXAM	3		FINAL EXAMINATION	For the final examination	English		Project work on a particular topic based on the internship carried out supervised by a tutor.	0	75
3	101138	MARITIME AND NAVAL HISTORY LABORATORY (NAVLAB)	6	M-STO/02	ELECTIVE LEARNING ACTIVITY	Student's elective learning activity	English		The course aims to analyze the general features and historiographical interpretations of maritime and naval history in the modern age.	60	90
3	101140	ELECTRIC MACHINES AND MAINTENANCE	6	ING-IND/32	ELECTIVE LEARNING ACTIVITY	Student's elective learning activity	English		Provide elements on the electrical equipment construction for low and high voltage applications. Provide the elements for diagnostics and maintenance of electromechanical components.	60	90

3	101141	ACCOUNTING AND CONTROL IN SHIPPING COMPANIES	6	SECS-P/07	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		The course will introduce the student on Analytical accounting and cost analysis. The planning and control procedures for budgeting. The analysis logic of the deviations.	60	90
3	101258	FIRST AID AND MEDICAL CARE	6	MED/09	ELECTIVE LEARNING ACTIVITY	Student's elective learning activity	English		The course will provide the skills related to the first and second level of training of seafarers designated to provide first aid and medical care on board the ships, in compliance to International Convention STCW 1978/1995 in its updated version in Manila in 2010.	60	90

**Curriculum “ENGINEER OFFICER AND ELECTRO-TECHNICAL OFFICER”**

Year	Code	teaching unit	ECT S	SSD	Type	Area	Language	Prerequisites	Training objectives	Hours for assisted teaching activity	Hours for personal study
1	101116	MATHEMATICS AND ALGEBRA	12		BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science				0	0
1	101117	MATHEMATICS	6	MAT/05	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The aim of this course is to provide a practical working tool for students where rigorous Calculus is needed. The main focus is on the study of functions of one real variable (continuity, derivative, maxima/minima, integration) and a brief introduction to multivariable calculus (oriented towards finding maxima/minima). The last part of the course is oriented towards basic ordinary differential equations (for example separation of variables, linear first-order, and constant coefficients ODE).	60	90
1	101118	ALGEBRA	6	MAT/03	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The course aims to provide basic technical notions and tools on complex numbers, linear algebra and analytical geometry.	60	90
1	101119	PHYSICS	6	FIS/01	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		Understand basic physical fundamentals and the key vocabulary to describe them: kinematics, dynamics, work and energy, rotations, fluids. Develop skills in observation, interpretation, reasoning, synthesis, generalizing, predicting, and questioning as a way to learn new knowledge. Develop scientific problem solving skills, including organization of given information, identification and application of pertinent principles, quantitative solutions, interpreting results, and evaluating the validity of results. Apply conceptual understanding of the physics to general real-world situations, and recognize how and when physics methods and principles can help address problems in their future courses and then apply those methods and principles to solve new problems.	60	90

1	101120	ICT	9	ING- INF/05	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The course aims at introducing the student in the field of modern electronic methods for the management of information, related communications and basic methods of calculation. The course follows two distinct strands; the first concerns the study of the architecture of computing systems, the representation of information within them, the organization and operation of networks and of the Internet; the second teaches on the fundamentals of programming.	72	153
1	101121	CHEMISTRY	6	CHIM/0 3	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		Acquiring rigorous methodology to describe as accurately as possible the fundamental phenomena that are the basis of chemical systems; knowing how to understand and use the minimum mathematical formalism required to interpret them. Physical and chemical properties of fuels, lubricant etc.	60	90
1	101122	OPTIMIZATION METHODS	6	MAT/09	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The Course introduces to optimization models and methods for the solution of decision problems, with particular attention to models and problems arising in Maritime. In particular the focus will be on route planning, cargo loading and stowage, flow management.	60	90
1	101123	SHIP STABILITY	9	ING- IND/01	CORE LEARNING ACTIVITY	Engineering disciplines	English		The course provides knowledge about the buoyancy and the stability of ships, both in intact and damaged conditions, with appropriate reference to relevant IMO regulations. Specific attention will be given also to some operational aspects e.g. to cargo handling and stowage.	90	135
1	101124	PHYSICS II	12	FIS/01	BASIC LEARNING ACTIVITY	Mathematics, Physics, Chemistry, Computer Science	English		The specific training objective is to provide the student with the ability to solve elementary but concrete problems. This implies that the student must know how to distinguish between fundamental concepts (electric and magnetic fields and forces, works, Gauss's laws, Ampere's, Faraday's, ...) and more specific issues (motion of charges in electromagnetic fields, cylindrical condensers, ...) demanding a thorough understanding of fundamental concepts.	96	204

2	101126	AUTOMATION AND CONTROL FOR ELECTRIC MARINE APPLICATIONS	6	ING-IND/33	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		Automation and control are essential functions for the ship correct and efficient management. The course presents the fundamental concepts of automatic control enabling the student to deduce mathematical models and to synthesize controllers by a practical approach for the dynamic systems of plants, processes and time-varying behaviors in electric, thermal and mechanical marine applications.	60	90
2	101127	MACHINERY	6	ING-IND/08	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		The module provides the students with the fundamental skills to interpret the processes, as well as the technologies, related to fluid machines, thermal machines and energy conversion systems. This allows the student to master the basic principles of thermodynamics and fluid dynamics when applied to the design and the analysis of energy conversion equipment, as well as to address the functional behavior of fluid machines.	60	90
2	101128	SHIP STRUCTURES AND STRENGTH	9	ING-IND/02	CORE LEARNING ACTIVITY	Engineering disciplines	English		The course aims at providing students with professional competences about fundamentals of shipbuilding and ship structures, showing typical methods and languages, i.e. structural plans and drawings, to describe the hull, its structural lay-out, its components and equipment. Various merchant ship types are presented, highlighting peculiarities of each. The course includes a description of ship structural design and analysis from a global view to construction details. The general scantling criteria of ship structures and components is also summarized with reference to rules and regulations of classification societies.	90	135
2	101129	SHIP PROPULSION	9	ING-IND/02	CORE LEARNING ACTIVITY	Engineering disciplines	English		The course will deal with the management and the operation of the propulsion plant. Plan and schedule operations: propulsive characteristics. Operation, performance assessment.	60	90
2	101130	ENGLISH	6	L-LIN/12	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		This course of scientific English enables students to gain sufficient specific knowledge in order to overcome the barrier of the English language, drawing from international scientific literature, not only for the purposes of professional updating, but also to master technical terminology in the maritime sector.	60	90
2	101131	SHIPBOARD POWER SYSTEMS	6	ING-IND/33	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		The teaching of shipboard electrical systems aims to consolidate the skills of the maritime students in an application context of the knowledge of electrical engineering. Training proposals are proposed on the knowledge of the principal components and main characteristics associate to electrical machines. The correct definition and basic sizing and operation of power system distributions and protection devices.	60	90

2	101132	SHIPBOARD POWER SYSTEM CONTROL	6	ING-IND/33	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		The aim of the course is to introduce students to the basic problems related to the operation of the electric propulsion on ships, to guide in understanding the technologies and electrical problems due to the complexity of the ship. The correct sizing and energy balance of the power system and basic configuration in compliance with the current normative and standards.	60	90
2	101133	ELECTROTECNICS	6	ING-IND/31	RELATED OR SUPPLEMENTARY LEARNING ACTIVITY	Related or supplementary learning activity	English		The course gives the essential elements for understanding of analysis and exploitation of the electromagnetic phenomena. In the first part of the course the instruments for static and quasi-static analysis by circuit methods are introduced. In the second part of the course the principal application aspects of exploitation of power electromagnetic phenomena are introduced: electrical motors, power electronics and power electrical systems.	60	90
2	101134	SHIP PLANTS AND SYSTEM SAFETY	9	ING-IND/02	CORE LEARNING ACTIVITY	Engineering disciplines	English		Design principles of ship propulsion plants, ship auxiliary plants and ship safety plants. Manage fuel, lubrication and ballast operations. Pumps and piping operation and maintenance. Manage safe and effective maintenance. Planning maintenance. Safety procedures. Life saving appliances. Fire fighting. Fire detection. Fire prevention	90	135
3	101125	INTERNATIONAL MARITIME LAW	6	IUS/06	CORE LEARNING ACTIVITY	Legal disciplines	English		The aim of the course is to introduce students to the knowledge of the basic items concerning the vessels' utilization, including their safety and security, and maritime carriages of goods, through an analysis of the relevant national, international and E.C. laws and rules.	60	90
3	101135	LEADERSHIP&TEAM WORKING	6	SECS-P/10	CORE LEARNING ACTIVITY	Economic and Corporate Disciplines	English		Ability to apply task and workload management. Shipboard personnel management. International conventions. Decision making techniques.	60	90
3	101136	TRAINING ON BOARD	30		FOR STAGES AND INTERNSHIPS	For Stages and Internships in Companies, Public or Private Institutions, Professional Associations	English		The curricular internship has the objective of including the student in a specific working reality of enbarquement or in industry in maritime sector.	0	750



3	101137	FINAL EXAM	3		FINAL EXAMINATION	For the final examination	English		Project work on a particular topic based on the internship carried out supervised by a tutor.	0	75
3	101138	MARITIME AND NAVAL HISTORY LABORATORY (NAVLAB)	6	M-STO/02	ELECTIVE LEARNING ACTIVITY	Student's elective learning activity	English		The course aims to analyze the general features and historiographical interpretations of maritime and naval history in the modern age.	60	90
3	101140	ELECTRIC MACHINES AND MAINTENANCE	6	ING-IND/32	ELECTIVE LEARNING ACTIVITY	Student's elective learning activity	English		Provide elements on the electrical equipment construction for low and high voltage applications. Provide the elements for diagnostics and maintenance of electromechanical components.	60	90
3	101141	ACCOUNTING AND CONTROL IN SHIPPING COMPANIES	6	SECS-P/07	ELECTIVE LEARNING ACTIVITY	Student's elective learning activity	English		The course will introduce the student on Analytical accounting and cost analysis. The planning and control procedures for budgeting. The analysis logic of the deviations.	60	90
3	101258	FIRST AID AND MEDICAL CARE	6	MED/09	ELECTIVE LEARNING ACTIVITY	Student's elective learning activity	English		The course will provide the skills related to the first and second level of training of seafarers designated to provide first aid and medical care on board the ships, in compliance to International Convention STCW 1978/1995 in its updated version in Manila in 2010.	60	90