ANNOTATIONS

Program: **NAVIGATION**
Professional orientation: **TRANSPORT, NAVIGATION AND AVIATION**
Professional qualification: **ENGINEER-NAVIGATION**
Academic degree: **BACHELOR**
Form of Study: **FULL-TIME**
Term of Study: **4 years / 8 semesters**

Discipline "Higher Mathematics, part 1", code (1)

The present course introduce the students to the basic notions and methods how to solve problems concerning the following areas of mathematics: matrices, determinants, matrix equations, systems of linear equations, operations with vectors, equations of straight lines and planes, second order plane curves and surfaces, differential calculus of functions of one independent variable, spherical geometry and trigonometry.
It has been built on the basic knowledge of high school mathematics and supplies other disciplines (like mathematics part 2, physics, theoretical electrical engineering, technical mechanics etc.) with necessary information to be used to.
Main issues of the syllabus content:
· Linear algebra
· Analytical geometry
· Differential calculus of functions of one variable
· Spherical trigonometry
Content presentation: lectures, seminars and tutorials

Discipline "Computer Science and Computer Technology", code (2)

This subject is intended to introduce students to modern computer systems and related types of information technologies. It gives basic knowledge in computer science, hardware and operating system software of personal computers. The subject teaches MS Windows integrated operational environment, computer graphics, computer text processing, electronic tables and diagrams - Microsoft Excel, presentations on Microsoft PowerPoint, computer networks.
Laboratory exercises aim at forming the necessary practical skills of students when they use computer systems.
The universal nature of the present study makes it practically open regarding its connection with each consequent subject in the teaching syllabus of the major.
Course main divisions:

- Use of Microsoft Word;
- Use of Microsoft Excel;
- Use of Microsoft PowerPoint;
- Use of INTERNET.

Discipline "Commodity Science", code (3)

The subject Commodity Science aims to give knowledge about the consumer value of goods transported mainly by water transport and their proper storage. The main purpose of the course is to give information about goods' classification, assortment, standardization, quality, packaging, marking and preservation as well as origin of goods, technology of production, properties, quality indicators, storage requirements, physical, chemical and biochemical changes due to improper storage.
Course main divisions:

- Introduction in Commodity science – fundamentals

- Commodity Sci. of industrial goods
- Commodity Sci. of food goods

Discipline "Engineer Graphics", code (4)

The discipline aims to teach students in order details of computer graphic, especially ACAD system and its implementation when making a project of a ship and naval facilities. The discipline includes : common structure of AutoCAD, details of graphic primitives, 2D and 3D objects.
Main issues of the syllabus content:
Content presentation: Lectures and laboratory exercises with AutoCAD.

Discipline "First Air", code (5)

The subject " First Air " for Navigation students aims at familiarizing and training the future specialists in rendering emergency first-aid medical assistance to injured crew members or passengers, as well as assessing the implications of already present diseases or accidents onboard ships where there is no professional doctor available.
Having the knowledge of the basic anatomical and physiological characteristics of the human body, the person rendering first aid (in this case the ship's Navigator) must be able to attend to diseases and conditions so much so that prior to the arrival of a professional doctor, the injured will have received adequate care relevant to the disease, without endangering the life of others, including the life of the first-aider or worsening the condition of the patient. Through lectures and laboratory exercises, the Navigators are acquainted with those cardiovascular, pulmonary, digestive and urinary system diseases requiring urgent intervention by a non-medical person for the purpose of preserving the patient's life. Incidents such as traumas, fractures, poisonings, bites, burns, frostbite, heat and sunstrokes, acute and chronic bleeding require urgent and adequate intervention to help the victim before any professional medical assistance is provided. Acute and chronic diseases involving pain and suffering as well as unconscious conditions also require adequate intervention before a professional doctor arrives or until the condition has been dealt with without the need for professional medical assistance. The training includes knowledge of the basic pharmacological groups of drugs as well as the required medical equipment available onboard different ships.
Primary topics in the training include:
- diseases
- accidents
- damage

Discipline "English, part 1", code (6)

The subject introduces the students to basic introductory topics of maritime English related to ship's operation, ship's construction, ship's gear, type of merchant ships, ports, cargoes and ship and port cargo-handling facilities. It also introduces typical maritime terminology so that acquired theoretical knowledge to be applied in practice and practical skills for reading comprehension and translation of specialized English texts to be built up. The subject aims at delivering to the students of Navigation course theoretical knowledge of grammar in general English context which to be used as a basis for creating skills for audio comprehension of English texts (developing listening skills) as well as to prepare them to lead conversations so they can further apply acquired theoretical knowledge and practical skills in everyday oral and written communication in English language. Students receive clarification about the importance of IMO SMCP for the maritime practice and training, how the phrases are organized and their basic communicative characteristics. Students are familiarized with the International Maritime Alphabet and message markers used in IMO SMCP. The syllabus complies with the recommendations of the IMO Model Course 3.17 Maritime English.
Basic sections of the contents:

- Introduction to Maritime English
- Grammar

Discipline " Specialized Sport Activities, part 1", code (7a)

The discipline is connected with swimming training by specific swimming exercises for maintain the health status of the students. The given theoretic and training potential gives students skills on swimming styles and especially freestyle stroke. There is an entrance level provided for physical capabilities of the students educated. The teaching program consists of 30 hours exercises in a swimming pool.

Main parts of content :

- Theoretic and methodic knowledge
- Special physical training
- Technical and tactic training
- Psychological and will training.

Discipline " Sport and Social Adaptation, part 1", code (7b)

The education program on Sport and Social Adaptation Part 2 lays in education plan for Bachelor degree of all subjects. The program is intended for students who are obliged to select in 1-st year of education due to physical deceases and health problems. The lectures material is in two semesters and covers topics of basics of sport as a factor of good psychical and physical health and its influence to effective social adaptation.

Main parts of content :

- Sport
- Social adaptation
- The place of sport for an effective social adaptation.

Discipline "Higher Mathematics, part 2", code (8)

The syllabus of Higher Mathematics-part 2 uses the knowledge which is obtained from the course of Higher Mathematics-part 1. It contains the following sections: integral calculus, ordinary differential equations, infinite series, function of a complex variable, theory of probability. The aim is to define the considered notions and their applications in the next topics of the course and in the engineering disciplines. Systems of computer algebra are used in the laboratory classes. These modern forms of education give students the opportunity to learn mathematics easily and consider it from another point of view.

Discipline "Seamanship", code (9)

The subject "Seamanship" is included in the curriculum of the "Navigation" – the educational degree "bachelor". The primary purpose of the education of seamanship is to make familiar the students with the construction of the ship hull, rigging and spar, the ship's systems and devices and to prepare them for their extensive research study in specific subjects. After the learning it the students must:

Know

- constructional elements of the hull and their purpose
- general systems, ensure its operating and survivability
- the main features of ship
- basic materials used in shipbuilding
- the methods to protect the hull from corrosion

Can

- to use the ship's rigging
- to entangle the main maritime nodes
- to use the individual and the collective rescue equipment

Be able

-to manage the corrosion fighting of the hull

- to manage the deck machinery using

The subject „Seamanship" ensure the following subjects:

- Navigation training
- Ship power plants
- Organization of the watch keeping and labor protection
- Ship theory
- Navigation – 1 part
- Technical means of the navigation
- Methods and means for environmental protection

Discipline "Technical Mechanics", code (10)

The subject "Technical Mechanics" consists of 4 parts: statics, strength of materials, kinematics and dynamics. The Statics classes discuss the methods of reduction and conditions for equilibrium of a force system. The conditions for equilibrium are used to determine the structural response of structures. The Strength of Materials lessons are a continuation of statics involving the methods of strength measuring for the main strengths: tensile strength, compressive strength, twisting, bending and a combination of them. The Kinematics classes provide information on the basic movements of the solid body: translation, rotation, and plane. The Dynamics examines methods for the movement of a mechanical system.

Each student receives an individual assignment, which must be prepared and defended within a deadline.

A prerequisite for the successful training in the subject is knowledge of certain sections of mathematics: vector calculus, differential and integral calculus and differential equations.

Primary topics in the training include:

- Statics
- Strength of materials
- Kinematics
- Dynamics

Discipline "Physics", code (11)

General Physics is a fundamental discipline, the basis of all applied technical sciences. Physical knowledge is of crucial importance for the future engineer –navigator. The course includes the major parts of Classical Physics- mechanics, thermodynamics, electrodynamics, oscillations and waves and also basic ideas of Modern Physics-relativistic and quantum mechanics, atomic and nuclear physics.

Course main divisions:

- CLASSICAL MECHANICS
- PERIODICAL PROCESSES
- THERMODYNAMICS
- ELECTROMAGNETIC PHENOMENA
- OPTICS
- SPECIAL THEORY OF RELATIVITY
- BASIC OF QUANTUM MECHANICS AND ATOMIC PHYSICS
- NUCLEAR PHYSICS

Discipline "Basic Training on Safety Issues", code (12)

The subject "Basic Training on Safety Issues" is included in the curriculum of the "Navigation" specialty - bachelor degree. The general purpose of education is that the students have to know the requirements of regulatory documents, ship documentation and safety rules.

Main sections of the content:

- Organization of the ship service
- Organization of labor protection
- Labor Safety Technique in Performance of Functional Tasks Check Sheets
- Safety and quality management. Documents and procedures

Discipline " English, part 2 ", code (13)

The subject continues to introduce the students to basic introductory topics of maritime English related to ship's arrival in port and her departure, procedures for berthing and unberthing, anchoring, mooring operations, pilotage; basic knowledge for main navigation terms, methods and instruments is taught; introductory information about weather conditions and their elements as part of preparing weather forecasts; OOW responsibilities; types of emergencies on board and the type of equipment and its position ensuring the safety of crew and passengers; introductory information about buoyage systems, lights and shapes. Students continue to use IMO SMCP related to the performance of different types of communications, topically organized. The subject introduces the typical maritime terminology so that the acquired theoretical knowledge to be applied and practical skills for reading –comprehension and translation of specialized maritime English texts to be built up. The subject continues to deliver to the students of Navigation course theoretical knowledge of grammar in general English context which to be used as a basis for consolidating skills for audio comprehension of English texts (developing listening skills) as well as to prepare them to lead conversations so they can further apply acquired theoretical knowledge and practical skills in everyday oral and written communication in English language. The syllabus complies with the recommendations of the IMO Model Course 3.17 Maritime English.

Basic sections of the contents:

- Introduction to Maritime English
- Grammar

Discipline " Specialized Sport Activities, part 2", code (14a)

The education program on Sport swimming suggests for specific swimming skills and the theoretical knowledge for health status gives also skills for better swimming capabilities. Special attention is pointed to basis tendentious in different styles when starting and finishing. Training backstroke freestyle.

Main issues of the syllabus content:

· Theoretical and methodical knowledge
· Common physical training
· Special Physical training
· Technical and tactical training
· Psychological an will training.

Discipline " Sport and Social Adaptation, part 2", code (14b)

The education program on Sport and Social Adaptation Part 2 lays in education plan for Bachelor degree of all subjects. The program is intended for students who are obliged to select in 1-st year of education due to physical deceases and health problems. The lectures material is in two semesters and covers topics of basics of sport as a factor of good psychical and physical health and its influence to effective social adaptation.

Main issues of the syllabus content:

· Sport
· Social Adaptation
· The place of sport for an effective social adaptation.

Discipline " Navigation Training, part 1", code (15)

Students from the major of Navigation are introduced to the organization of the work onboard a ship and the normative documents regulating it, the ship standing orders and the duties of the crew while performing them, with the order and life aboard. Students learn the basic elements, tasks and responsibilities related to the Safety Management and Quality System on board a ship in compliance with the requirements of ISM code and ISO 9002 standard

Basic sections:

- Basic principles of ship's organization.

- Watch keeping.
- Life onboard, personnel safety and technical safety.
- General arrangements of the ship, ship systems, machinery and equipment

Discipline " International Marine Conventions", code (16)

The students are acquainted with the main aspects providing shipping safety and protecting the marine environment.
The following conventions are examined STCW-78/95, SOLAS, MARPOL and other acts.
Main issues of the syllabus content:
- The students are acquainted with the main conventions and agreements, which form the regulatory base of the shipping;
- The base conditions of the conventions are examined. The purpose of the conventions and the way of control and reports etc.

Discipline "Leadership and Teamwork", code (17)

The purpose of the Leadership and Teamwork program is to introduce students to modern understanding and basic methodological approaches, specific practices in the field of leadership and team development in the organization. Attention is given both to improving students' theoretical views and to acquiring practical skills for self-management and efficiency, team inspiration, motivation, decision-making, conflict management, assertiveness and counseling.
Main issues of the syllabus content :

- Basic leadership theories;
- Modern approaches to leadership;
- Leadership style and the ability to provide a competitive advantage to the organization;
- Groups and group functioning.
- Stages in Group Development. Manage the process.
- Team building and development.

Discipline "Means and Methods of Environmental Preservation", code (18)

The students are trained in the basic principles to ensure marine environmental protection and marine pollution prevention – normative basis, organization, methods of marine pollution prevention.
Basic sections:

- normative basis of the problem
- organization, methods and means of marine pollution prevention
- operational requirements of the ship to avoid marine pollution
- ship organization for action in emergency in cases of oil spills
- port organization for ensuring the cleanness of the harbour areas

Discipline "Safety of Navigation", code (19)

The students get acquainted with the basic principles for ensuring the safety of navigation and marine environmental cleanness protection. The relevant conventions STCW-78/95, SOLAS, MARPOL and other normative acts and regulations are being taught.
Basic sections:

- normative basis of the problem
- national and international legislation regulating the safety of navigation, conventions, codes, decrees and regulations;
- ship organization for the safe performance of on board activities and care of the persons on board – watches, duties, responsibilities when carrying different cargoes and marine pollution prevention, fire protection, buoyancy, operation of the life-saving appliances, medical assistance;
- port safety organization – fire protection, when handling dangerous goods, harbor areas cleanness protection;

- organization, methods and means of marine pollution prevention

Discipline "Electrical Engineering and Electronics", code (20)

The subject "Electrical Engineering and Electronics" (EEE) is the study of basic physical processes in electrical equipment, analysis of electrical and electronic systems, introduction to methods and tools for measuring electrical, magnetic and non-electrical quantities and formation of practical skills for their application using special models and programs; familiarization with the principle of operation and characteristics of the main groups of electromechanical and electronic devices and building skills for selecting and sizing of individual components.
The "EE" course requires student knowledge of mathematics and physics.
Main sections of content:
• Electromagnetic field
• Electrical circuits;
• Magnetic circuits and transformers;
• Electrical machinery;
• Measurements in electrical engineering;
• Electronics.

Discipline "English, part 3", code (21)

The aim of the course is to acquaint the students of Navigation with the basic maritime terminology so that they could build practical skills for reading comprehension and translation of original texts in Maritime English related to accidents at sea. Excerpts from the International Convention for Preventing Collisions at Sea are also studied which aims at acquiring the necessary terminology. Grammar exercises are provided to review the language skills developed during the first two semesters. The syllabus elaboration takes into account the recommendations of the IMO Model Course 3.17 Maritime English.
Basic sections of the contents:
• Reporting accidents at sea and on board due to noncompliance with the safety regulations and requirements
• Terminology associated with the International Regulations for Preventing Collisions at Sea
• Revision of grammar

Discipline "Specialized Sport Activities, part 3", code (22a)

Discipline "Sport Management, part 1", code (22b)

Discipline "Meteorology and Oceanography ", code (23)

This subject aims at helping students with theoretical and practical knowledge of the basic phenomena and processes taking place in the atmosphere and the ocean and influencing the sailing; to introduce them to ways of carrying out meteorological observations onboard, analysis and practical use of meteorological information and weather forecasts received on board ship, as well as local weather conditions; defining elements of tides and currents.
Basic sections:
- Meteorology
- Oceanography

Discipline "Navigation I, part 1", code (24)

Basic sections of the contents:
• Models of the Earth. Principal points, lines and planes used for orientation at the Earth surface
• Methods for determination of the directions at sea
• Methods for determination of the ship's speed and run distance

- Aids to navigation of the sea and ocean theatres
- Projections for charts, nautical charts and their use
- Calculation of the ship's coordinates under different by complexity sailing conditions

Discipline "Ship Theory And Structure", code (25)

Basic sections:

- Transport characteristics of cargoes.
- Regulating the microclimate in cargo holds.
- Shipping of bulk cargoes.
- Shipping of general cargoes.
- Special regime cargoes.
- Shipping of unitized cargo units.
- Basic technologies on the tanker exploitation of the tankers.
- Making calculations in cargo operation of the ship. Cargo stowage plan.

The subject studies the sum of specific properties featuring transport characteristic of cargoes, shipped at sea.

Students gain knowledge necessary for ensuring safe sea passage without accidents during shipping of different types of cargo. As a result of knowledge gained from the subject students should be capable of making calculations for drawing up of ship cargo plans.

Discipline "English, part 4", code (26)

The course aims at providing students with theoretical knowledge of maritime terminology as well as building skills for reading comprehension and translation of excerpts from Guides to Port Entry which are present on the bridge of most merchant ships. The course aims at familiarizing students with basic terms associated with certain publications of the British Admiralty as well as building skills in reading comprehension and translation of Pilot Books, Notices to Mariners, Admiralty Lists of Lights and Fog Signals, Admiralty Lists of Radio Signals and other nautical publications used by seafarers. The information and terminology present in the Admiralty charts are studied as well. The syllabus elaboration takes into account the recommendations of the IMO Model Course 3.17 Maritime English.

Basic sections of the contents:

- Information and Terminology from Guide to Port Entry
- Information and Terminology from Navigational Charts
- Information and Terminology from Sailing Directions
- Information and Terminology from Mariner's Handbook, Notices to Mariners, List of Lights and Fog Signals, List of Radio Signals

Discipline "Specialized Sport Activities, part 4", code (27a)

Discipline "Sport Management, part 2", code (27b)

Discipline " Navigation Training, part 2", code (28)

The sailing practice is conducted in accordance with the requirements of the International Convention on Standards of Training and Certification of Seafarers - STCW78/95 as amended and Ordinance 6, issued by the Maritime Administration of the Republic of Bulgaria.

The training objectives of the sailing practice are achieved during the mandatory deep sea voyage for a period of not less than 3 months.

The sailing practice is an obligatory part of the training of Navigation students at the Technical University -Varna and during its course students must acquire skills and habits and be able to perform the duties of a watch keeping officer.

Primary topics in the training include:

- Navigation tasks
- Astronomical tasks
- Cargo stowage tasks
- Practical Training Logbook Sections 1, 2, 3, 4, 5
- Navigation
- Cargo Loading Operations
- Ship Operation and Caring for Persons on Board

Discipline "Navigation I, part 2", code (29)

Students are introduced to the theory of navigational concepts, the basic principles of navigating under different navigational and hydro-meteorological conditions using all technical measuring for navigation and navigation systems, navigation systems and complexes for ensuring safety of navigation and reliability of the voyage at sea. Dead reckoning of ship's coordinates is also reviewed.

Basic sections:

- GENERAL POINTS, LINES AND PLANES FOR ORIENTATION OF THE SHIP ON THE EARTH'S SURFACE.
- DETERMINATION THE DIRECTIONS AT SEA
- DETERMINING THE SPEED AND DISTANCE BY SHIP
- MEANS FOR NAVIGATION EQUIPMENT FOR SEA AND OCEAN ZONES
- CARTOGRAPHIC PROJECTION
- DEAD RECKONING OF THE SHIP'S COORDINATES
- THEORY OF THE LINE OF POSITION
- ACCURACY OF THE NAVIGATIONAL MEASUREMENTS
- DETERMINATION OF THE SHIP'S POSITION
- ESTIMATION OF THE ACCURACY OF THE DETERMINED POSITION OF THE SHIP
- SAILING ACCURACY
- DETERMINING THE MOST PROBABLE POSITION OF THE SHIP UPON THE EXISTENCE OF SEVERAL POSITIONS REDUCED TO ONE MOMENT

Discipline " Ship's Operation and Cargo Handling, part 1", code (30)

The discipline deals with the study of the particulars and capabilities of the ship as a means of transport, the safety and efficiency requirements in passage planning, the consistency in formulating the ship's stowage plan and providing the seaworthiness of the ship during the voyage. Students are given the knowledge necessary to ensure the safe navigation of the ship without any emergencies in the carriage of different types of cargo in view of the ship's stability, strength and overall sailing capacity, as well as the most efficient use of the ship's load capacity under different operating conditions. As a result of the study of the discipline, students are able to estimate the effect of cargoes, including heavy lifts, on the navigability, seaworthiness and stability of the ship.

Main issues of the syllabus content:

- Draft, trim and stability
- Cargo Securing
- Deck Cargo
- Cargo in containers
- Bulk cargoes
- Carriage of grain in bulk

Discipline "Damage Control on Board the Ship", code (31)

Students from the major of Navigation are introduced to ship's emergency organization, , ship's contingency plans and crewmembers' duties on their carrying out, organization of emergency rescue operation. They study basic elements, tasks and responsibilities concerning Safety and

Quality Management System onboard the ship according to requirements of ISM Code and ISO 9002 standard.
Basic sections:

- General issues of ship theory
- Fighting for unsinkability of the ship.
- Fire and explosion safety of the ship. Firefighting onboard the ship.
- Ship's emergency organization.
- Emergency and rescue operations at sea.

Discipline " Pilotage and Hydrography", code (32)

This subject is intended to teach the students of Navigation the theory and construction of the navigational equipment of the sea route, the order of making hydrographic surveys and the methods applied, the principle and organization to ensure the safety of navigation and the responsibilities of the people involved. As a result after completion of the course students should be able to plan ship's passages, carry out hydrographic surveys, plot coastal lines and use and constantly update charts, guides and navigational aids.
Basic sections:

- navigational aids used for sea routes;
- use of charts and navigational aids for sea routes;
- maneuvering boards and charts used for hydrographic research;
- carrying out hydrographic research.

Discipline "English, part 5", code (33)

The subject aims to develop students' practical skills in making up witness statements on various accidents at sea by developing their written culture in a specialized context. For this purpose, revision of the past tenses in the English language in a maritime context is included, the reasons and circumstances for writing a witness statement are explained, the structure of a witness statement is presented, a revision of terms is made and knowledge of terms is enhanced in the process of writing, related to accidents on board and at sea. The syllabus complies with the recommendations of the IMO Model Course 3.17 Maritime English.
Basic sections of the contents:

- Revision of past tenses in a maritime context
- Explaining the reasons and circumstances for writing a Witness Statement. Presenting the structure of a Witness Statement
- Making up witness statements on behalf of a ship's mate on the basis of marine accidents.

Revision and enhancing the knowledge of terminology related to accidents at sea and on board in the process of writing

Discipline "Ship Power Plants", code (34)

The subject "Ship power plants" is included in the curriculum of the "Navigation" specialty - bachelor degree The main objective of the training in ship power plants is to familiarize students with the purpose, structure and principle of action of the elements of the ship power plants, composition and operation of the ship propulsion complex, the organization of the technical operation of the ships
Main sections of the content:

- ship power plants
- marine diesel engines
- ship auxiliary machinery

Discipline "Astronavigation", code (35)

The purpose of the subject is to prepare students – navigators about the natural laws of visible movement of celestial bodies, ephemerid astronomy, systems of tie measurement, theory and

practice of the astronomical observations and methods of finding ship's position and compass error astronomically. As a result of studying of the subject the students must be able to work with astronomical instruments and tools and to know the common and the special cases of finding ship's position and compass error by celestial bodies.
Basic sections of the contents:

- Spherical coordinates of the luminaries;
- Visible movement of the luminaries;
- Ephemerides of the luminaries;
- Astronomical instruments and devices used in navigation;
- Correcting of the altitudes of the luminaries;
- Celestial navigation. Fixing ship's position.
- Finding compass error.

Discipline "Technical Aids to Navigation", code (36)

The subject aims at teaching the students the theory, structure and rule of operation of the technical aids of navigation, types of errors and their indications and ways to eliminate and determine them. As a result the students should be able to check and adjust the equipment aboard the ship.
Basic sections:

1. Main idea of acoustic theory;
2. Concepts of acoustic logs;
3. Concepts of ships absolute speed measure instruments;
4. Concepts of ships radio Doppler logs ;
5. Concepts of shore systems for safe berthing.
6. Determining deviation of magnetic compasses;
7. Eliminating types of deviation of magnetic compasses;
8. Applied theory of gyroscopes;
9. Gyroscopes with autonomous sensitive elements and influence of ship maneuvering factors on its accuracy.

Discipline "English, part 6", code (37)

The subject aims to introduce students to the key factors in cargo operations, ensuring the safety of the ship and crew. The issues of packaging, marking, handling, stowage and securing of cargo are discussed. Information is introduced about the most important cargo documents which are used in relation to loading and discharging the cargo. An emphasis is put on the use by students of the IMO Standard Marine Communication Phrases related to cargo and cargo handling. The subject aims to introduce specific terminology and to develop skills for reading comprehension of texts in cargo work and develop skills in oral communication using IMO SMCP. Dialogues are made simulating communication between ship and shore personnel in relation to ship loading / unloading operations. The subject introduces the work on making up a sea protest with the task to develop students' practical writing skills. The syllabus complies with the recommendations of the IMO Model Course 3.17 Maritime English.
Basic sections of the contents:

- Cargo Work
- Explaining the reasons and circumstances for writing a Sea Protest. Presenting the structure of a sea protest. Making up a sea protest

Discipline "Theory of Maneuvering", code (38)

The subject "Theory of maneuvering" contains four basic parts: general theory of maneuvering, determination of the elements of target ship's movement (ETM), special tasks of maneuvering and passing each other on safe distance of the ships in restricted visibility.
In part I the basic terms and determinations in the maneuvering, elements of maneuvering and

position, applying of relative motion method during maneuvering of two ships.
In part II the methods for determining ETM.
In the part III, "Special tasks of maneuvering", the questions for approaching to the object of maneuver and deviation from it and questions of maneuvering during sailing in convoys are treated.
The part IV treats the questions for maneuvering of the ships in restricted visibility for safe passing with one, two and more targets with change of course, speed or both simultaneously, carrying out and control of the maneuver until the completion of passing with the target.
Laboratorial exercises have purpose to form in the students the necessary practical habits for solving the tasks of ships' maneuvering on chart and on maneuvering board.
Basic sections of the contents:

- Basic terms, basic elements, relative motion;
- Determination of the elements of target movement (ETM);
- Special tasks of the maneuvering;
- Passing at safe distance in restricted visibility.

Discipline "Ship's Operation And Cargo Handling, part 2", code (39)

The subject deals with the education of the set of defined capabilities representing the transport characteristics of cargo carried by sea. By this subject, the students from the specialty "Navigation" study the rules for the carriage of goods by sea, ensuring that their consumer value is maintained. There is taken attention for questions on the proper operation of ship's technical equipment, devices and mechanisms during loading and unloading operations as well as the safe handling, distribution and securing of cargoes. Students gain the knowledge necessary to ensure safe and unplanned sailing in the carriage of various types of cargo. As a result of the study of the subject, students are able to make calculations of the ship's cargo plan.
General sections of the content:

- Cargo care
- Equipment for handling cargo and safety
- Oil tanker handling systems and pumps
- Precautions before entering into the closed and pollution compartments areas
- Calculating the amount of cargo for the trip and drawing up the cargo plan

Discipline "Navigation II ", code (40)

Students are trained in the theory and practice for determining the ship's position and estimating its accuracy by using classical visual aids, as well as by means of radar location, radar navigation and satellite systems, having mastered the specific operation of the various aids and receiving indicators, used to measure navigation parameters. They carry out schedules for planning the ship's voyage in narrows, coastal areas and ocean passages.
Basic sections:

- Determining the ship's position by visually observed land marks.
- Classification of radar systems
- Determining ship's position with radar stations
- Determining ship's position by hydro acoustic means
- Determining ship's position by radar bearing
- Determining ship's position by hyperbolic radio systems
- Determining ship's position with satellite

Discipline "Navigation Training, part 3", code (41)

Navigation Training, part 3 is to take place only after successful completion of Navigation Training, part 2 and after the second or third year of study. The main objective of this practice is to teach how to perform the main duties and activities of the deck cadet and the naval officer. During this Practice students participate in the work of the Deck Department and the navigational team on the

bridge, carrying out specific tasks under the guidance of the ship's Master or the officers designated by him. At the end of this Practice students must know and be able to perform the duties of the deck cadet, which is the first step in the professional development of navigational officers and the first position to be taken by them upon graduation.
Primary topics in the training:
- Tank measurement
- Technical Maintenance of the Ship
- Maintenance of Lifesaving and Firefighting Equipment
- Deck Operations
- Mooring Operations
- Pilot Embarkation and Disembarkation Operations
- Port Operation and Cargo handling Operations.
- Watch keeping and Security Activities.
- Log keeping during a Sea Voyage.
- Navigation

Discipline "Navigation III", code (42)

Students are trained for natural trials of sea going vessels, ensuring safety of navigation when sailing in areas different in their navigation and hydro meteorological characteristics. Issues of automated processing of navigational information are covered in detail, as well as those for automation of vessel traffic control and automation of processes of vessel traffic separation. Having completed their studies in the subject students should be able to know the basic models of automated course reckoning of vessels, to work with ECDIS and AIS, to use systems for automated regulation of vessel's course and algorithms of ship's control when passing by other vessels.
Basic sections:

- SECURING SHIP'S NAVIGATIONAL SAFETY
- SAILING IN CONDITIONS OF RESTRICTED VISIBILITY AND DRIFT ICE
- NAVIGATION IN HIGH LATITUDES
- SAILING ON INTERNAL WATER ROUTES
- NAVIGATIONAL SECURING WHEN SAILING IN EMERGENCIES AND AT SEARCH AND RESCUE OPERATIONS.
- NATURAL TRIALS OF SHIPS
- AUTOMATION OF NAVIGATIONAL DATA PROCESSING.
- AUTOMATION OF SHIP'S MOVEMENT CONTROL..
- AUTOMATION OF PROCESSES OF SHIP'S PASSING BY OTHER VESSELS.
- TRANSFORMING SOME SHIP CONTROL PROBLEMS INTO ALGORITHMS.
- AUTOMATED SYSTEMS OF NAVIGATION AND SHIP CONTROL.
- AUTOMATION OF PROCESSES OF NAVIGATION BY MEANS OF ELECTRONIC CHARTS

Discipline "Usage of ECDIS and AIS", code (43)

In the course " Usage of ECDIS and AIS ", the essence of Electronic Navigation Charts (ENCs), ECIS and all related standards is studied. Basic definitions and terminology associated with electronic navigation cartography; All navigational marks in electronic charts; The methodology for developing ENCs; Compilation of ENCs upon their introduction in ECIS, Working with ECIS; Mistakes made in the development of electronic charts that impede their correct behavior when they are introduced to ECIS; The mistakes of the cartographer that can mislead any captain. In the course "Use of Electronic Charts and AIS" students should acquire the necessary theoretical knowledge and practical skills to work with ECIS in order to be able to carry out safe navigation.
Students should be familiar with the types of electronic charts and standards, the contingency marks and the system data, the basic navigation functions and settings, passage planning and monitoring, the ways and procedures for updating ENCs and the limitations and dangers of overreliance on working with ECIS.

Students should be able to make system settings, to plan and monitor the passage, to analyze and respond adequately to ECIS alerts and sensor signals, to assess adequately the accuracy of the sensors for safe system use and evaluate the errors due to inaccurate data.
Main issues of the syllabus content :

- Marine navigation charts, paper navigation charts, vector and raster electronic navigation charts (ENC and RNC), Electronic Charts Information System (ECIS) and Standards for their development.
- Elements of ECDIS
- Navigation Watch using ECDIS
- ECDIS route, planning and observation
- Objects in ECDIS, Marine Charts and Systems. ECDIS responsibilities and assessment

Discipline "English, part 7 ", code (44)

The subject aims to develop students' skills and habits for working with, reading and understanding meteorological information, symbols and abbreviations, weather warnings. Selected texts introduce the specific terminology related to the various electronic aids to navigation. Emphasis is placed on GMDSS incorporated in the Maritime English lessons: basic features of the system are explored; students are introduced to distress, urgency and safety communication; MSI features are introduced; students develop skills in reading comprehension and translation of texts related to GMDSS; the specific terminology is discussed; examples of routine communication within GMDSS are reviewed. The IMO Standard Marine Communication Phrases are introduced for distress, search and rescue, urgency and safety and routine communication. Students listen to and form dialogues on the communication between ships with VTS centers. Work with technical texts is carried out related to the shipboard maintenance and the operation and maintenance of navigation equipment so that students can develop skills in reading comprehension of such texts. The syllabus complies with the recommendations of IMO Model Course 3.17 Maritime English.
Basic sections of the contents:

- Meteorological Information
- Overview to Electronic Aids to Navigation
- GMDSS
- IMO SMCP covering emergency communication
- IMO SMCP covering routine communication
- Shipboard Maintenance. Operation and Maintenance of Navigational Equipment

Discipline "Radar Watch And Plotting", code (45)

The subject Radar Watch and Plotting is carried out during laboratory exercises in three stages:
First stage – plotter solving of problems for obtaining TME, CPA,TCPA and passing clear of one, two or three targets;
Second stage – use of the radar simulator for obtaining TME, CPA, TCPA and passing clear of one, two or more targets, maneuver control and correction
Third stage – use of ARPA to ensure passing clear of one, two or more targets and navigation in narrow waters.
Basic sections:

- Plotter solving of problems for passing at a safe distance;
- Use of the radar simulator for passing clear;
- Use of ARPA for passing clear.

Discipline "Ship's Handling and Bridge Team Management and Teamwork", code (46)

The purpose of the discipline is to introduce to the students the base principles of the ship's handling and the bridge team management. It is based on the requirements of STCW 1978/95 Convention, and IMO/ILO Documents for guidance, 1985, Section 3.6, as indicated in IMO Model Course 7.03, Module 1, Paragraph 1 and Model Course 7.01, Paragraph 1.1 and 1.2. The discipline

covers competency of Navigation at the operational level, in accordance with STCW Code A-II/1, 2010.
Main issues of the syllabus content:
- Ship's Handling;
- Bridge Team Management;

Laboratory classes in Ship's Handling

Discipline "Collision Regulations, part 1", code (47)

The discipline target is to provide the required training as per Convention on the International Regulations for Preventing Collisions at Sea, 1972 - COLREGs '72. In the result the students will be able to analyze situations where a risk of collision exists and how to take a right decisions. The teaching/training is carried out on a simulator. The discipline supports the following subjects "Navigation", "Theory of the maneuvering" and "Ship handling".
Basic sections of the contents:
- General definitions connected with safety at sea;
- General definitions connected with lights and shapes

Discipline "English Simulator in Emergencies", code (48)

Basic sections of the contents:
- Basics of the Standard Marine Communication Phrases (SMCP)
- International phonetic alphabet
- Maritime English communications in different types of extreme situations (emergencies) – fire, explosion, flooding, grounding, sinking, search and rescue, etc., though use of SMCP
- Form of presentation: The studies content is presented in the form of practical exercises. In addition students must do out-of-class work on the following topics: Man-over-board communications; Piracy/armed robbery situation communications; Medical advice communications. An optional of training – distant learning.

Discipline "Communications at Sea", code (49)

Basic sections of the contents:
- Theoretical and technical basics of the Global Maritime Distress and Safety System (GMDSS): international regulation of the maritime communications; types of stations and messages; high-priority signals of special importance; radio equipment modes of operation; frequencies and frequency bands in the Maritime Mobile Service and Maritime Mobile Satellite Service; types of radio channels; modulation, classes of emission; radio waves propagation of the different frequency bands; MF, HF and VHF ship radio equipment; ship antennae; ship radio station power supply, batteries
- GMDSS subsystems and equipment: MF, HF and VHF equipment; DSC system; Telex over Radio (NBDP) system; INMARSAT satellite system; COSPAS-SARSAT system, emergency radio beacons (EPIRB); NAVTEX system and other systems for distribution of maritime safety information (MSI); survival craft equipment; concept, composition, structure, functions and capabilities of GMDSS. GMDSS equipment requirements
- Communication procedures for distress, urgency and safety situations
- Cancellation of false signals and messages
- Routine communications procedures
- Messages charging
- Certificates and other documentation of the ship radio station
- Radio Log and regulations for making records and keeping the log. Radio traffic accounting
- Duties of the radio operator on watch
- Search and Rescue actions and communications. IAMSAR
- Form of presentation: Form of presenting the studies contents: The studies contents is presented in the form of lectures and practical exercises. The practical exercises in support of the

lectures are conducted by use of simulators and real communications equipment, using the proper procedures and ship documentation. These exercises are aimed at consolidation of the theoretical knowledge and working-out steady skills for organization and conducting the ship's communications. In addition students are assigned tasks for individual self-preparation with the objective to extend and make deeper their knowledge and skills affiliated with topics of the subject of key importance.

Discipline " GMDSS", code (50)

The discipline covers the main technical part, regulations and procedures for communications, as described in IMO model course 1.25 "General Operator's Certificate for GMDSS". The tuition is based on discipline "Marine communications" which contains main theoretical basis of the GMDSS.
Main issues of the syllabus content:

- Introduction in GMDSS. International Convention for the Safety of Life at Sea, SOLAS 74 as amended. General purpose, functions and structure of GMDSS;
- Ship's transceivers for medium, high and ultrahigh waves (MF/HF/VHF);
- Digital Selective Calling (DSC);
- Radio telex – NBDP;
- Inmarsat system;
- COSPAS-SARSAT system. Emergency radio buoys (ERIRB);
- NAVTEX system and other systems for transmitting marine safety information (MSI);
- Specific characteristics and requirements for GMDSS;
- Purpose and methods for use of the ship's reporting systems;
- Tests of the radio equipment. Cancelling of a false distress alert;
- Distress, Urgency, Safety and Route Communication procedures;
- Messages and radio traffic charges;
- Certificates and documents of ship's radio station;
- Search and Rescue operations. IAMSAR.

Discipline "English, part 8 ", code (51)

The course aims at discussing typical actions during accidents as well as emergency onboard procedures, enriching the terminological knowledge of students, developing reading comprehension skills and translation of selected specialized texts on the subject. Emphasis is placed on familiarizing students with the IMO Standard Marine Communication Phrases in relation to safety on board. The structure and purpose of the IMO conventions and codes as well as the purposes and procedures of the Port State Control are discussed. Students are trained to read and write letters, emails and faxes related to cargo-handling operations, developing practical skills for ship`s correspondence. The IMO Standard Marine Communication Phrases on passenger care on board passenger ships are reviewed. The syllabus complies with the recommendations of IMO Model Course 3.17 Maritime English.
Basic sections of the contents:

- Emergency Responses on Ships. Emergency Procedures
- Brief Introduction to IMO Conventions and Codes. Port State Control
- Revision of Tenses for Making up Ship's Correspondence
- Explaining the Structure of Writing Letters, E-Mails, Faxes
- Reading Samples and Writing Ship's Correspondence
- IMO SMCP for passenger care

Discipline "Collision Regulations, part 2", code (52)

The discipline target is to provide the required training as per Convention on the International Regulations for Preventing Collisions at Sea, 1972 - COLREGs '72. In the result the students will be able to analyze situations where a risk of collision exists and how to take a right decisions. The teaching/training is carried out on a simulator. The discipline supports the following subjects

"Navigation", "Theory of the maneuvering" and "Ship handling".
Basic sections of the contents:

- General definitions connected with safety at sea;
- General definitions connected with lights and shapes