



PROGRAMME OF STUDIES	
SEM 1-7 B.Sc PROGRAMME	FACULTY OF NAVIGATION
	SECTION: NAVIGATION
	GROUP: SEA TRANSPORT

Unit responsible	
1	Department of Navigation
2	Department of Ship's Operation
3	Department of Meteorology and Oceanography
4	Department of Transport Systems
5	Department of Mathematics
6	Department of Marine Electrical Power Eng.
9	Department of Engineering Sciences
12	Department of Physics
13	Department of Ship Automation
14	Department of Chemistry and Industrial Commodity Science
15	Department of Management
18	Department of Humanities
23	Department of Physical Training
24	Department of Foreign Languages

## FACULTY OF NAVIGATION

**Fall semester (I); SUM of ECTS: 30**

No.	Course title	Description	A	C	L	ECTS	Unit
1	Occupational Safety And Health Management	Safety of work during cargo operations on board vessels and port warehouses.	15			2	2
2	Ship Electrical Engineering	The purpose of the subject is to provide students with main concepts of Electricity and Electrical Engineering necessary for understanding functioning of electrical equipment of the ship. Students are also acquainted with general knowledge of this equipment, especially with measuring equipment in theoretical and practical manner.	15		30	4	13
3	Economics	Fundamentals of micro and macroeconomics, for example, consumer behavior, enterprise management, market, system transformation in Poland and economics systems, national income growth, unemployment and inflation, financial policy, budget, capital market, international cooperation and foreign trade etc.	30	15		2	15
4	Physics	Lectures: fundamentals of physics.Motion in one,two and three dimensions, Newton`s laws,work and mechanical energy,gravitation and electric and magnetic fields, fluid mechanics ,periodic motion,mechanical waves, thermodynamics, electromagnetism, optics. Laboratory: performing physics experiments according to the subject of lectures.	15		30	4	12
5	English	General English: Maritime English- Ship. Types of Ships,. Ship's Crew Organization. Seamarks and Landmarks. Communication at Sea. SMCP		45		2	24
6	Sea Communication	International Code of Signals, Distress Message- obligation and Procedure, Marine radio communication facilities available for signaling and distress purposes.	15		15	2	2
7	Mathematics	Basic topics of algebra: complex numbers, matrixes and determinants, systems of liner equations. Analytical geometry. Mathematical analysis: differential and integral calculus.	45	30		6	5
8	Colreg	Basic information about Colreg, history of implementation, methods of application, Rules 1-5 and Rules 20-35 (lights, shapes and fog signals).	15		15	2	1
9	Navigation	Definitions – Earth, Coordinates, Rhumb Line and Great Circle, Nautical Mile and other maritime measurement units, Cartographic Projections, Datums, Distances, Directions, Magnetic Compass, Compass correction, Aids to navigation, IALA Buoyage System, Navigational Charts and publications, Charts Abbreviations and Symbols, Chartwork Exercises.	15	15	15	4	1
10	Basic Seamanship	Anchoring, mooring, life saving equipment, fresh water, bilge-water, ballast, cargo ventilation systems.	15			2	2
11	Sports	Swimming-pool: Basic water techniques and behaviour. Teaching to swim the breaststroke and backstroke. Gym hall: Improvement of motor skills (speed, endurance, strength, jump training, agility, flexibility etc.).		30			23

## FACULTY OF NAVIGATION

**Summer semester (II); SUM of ECTS: 30**

No.	Course title	Description	A	C	L	ECTS	Unit
1	Basic Principle Of Electronics	Basic principle of electronics	15		15	2	1
2	Physics	Lectures: Introduction to modern physics. Relativity, the wave nature of particles, quantum mechanics, atomic structure, nuclear and particle physics. Laboratory: performing physics experiments according to the subject of lectures.	15		15	3	12
3	Informatics	Data representation. Programming in Pascal. Introduction to object programming.	30		30	4	1
4	English	General English: Maritime English- Meteorological Terms. Safety Equipment. Charts. Aids to Navigation. Lines and Ropes. SMCP		45		2	24
5	Machine Design & Engineering Graphic	The chosen fundamentals problems of statics and strength of machine elements. The basis of engineering drawing.	15	15	15	3	9
6	Mathematics	Multidimensional mathematical analysis: differential calculus of functions of several variables, multiple integrals. Sequences, numerical and function series. Spherical trigonometry. Elements of probability calculus.	45	45		4	5
7	Meteorology And Oceanography	Oceanography: marine sediments, geology and the coastal regions, sea temperature, salinity, density, sea ice, ship icing, ocean waves, sea state, ocean circulation, seiche, surge. Meteorology: radiation, energy balance, air temperature, evaporation, humidity, atmospheric instability, clouds, precipitation, fog, visibility	30		15	3	3
8	Navigation	Mercator Projection, Gnomonic projection, transverse Mercator Projection, Dead Reckoning, Charts Corrections, Notices to Mariners, Navigational Warnings, Hydrographic Publications Correction, Information from charts, list of lights and other publications, Electronic Navigational Chart and ECDIS, Chartwork Exercises.	15		30	2	1
9	Navigational Equipment	Marine logs. Gyrocompass. Autopilots.	15		15	2	13
10	Sports	Swimming-pool: Teaching to swim freestyle. Gym hall: Improvement of skills in team oriented games (basketball, volleyball, football etc.).		30			23
11	Basic Sea Practice					5	1

## FACULTY OF NAVIGATION

**Fall semester (III); SUM of ECTS: 30**

No.	Course title	Description	A	C	L	ECTS	Unit
1	Celestial Navigation	The determination of position At sea from altitudes and azimuths of celestial bodies. The calculation of angles and Times of astronomical phenomena with help of The Nautical Almanac.	15		30	3	1
2	Construction And Stability Of Ship	Dimensions and hydrostatic dates, calculation of ship parameters, construction of ship.	30		30	4	2
3	English	General English: Maritime English- Weather Forecasts. Electronic Aids to Navigation. Navigating Techniques and Instruments. Types of Cargo. SMCP		45		2	24
4	Meteorology And Oceanography	Meteorology: atmospheric pressure, winds, circulation within the troposphere (Hadley and polar cells), air masses, highs, fronts, lows, trades, ITCZ, monsoon, tropical cyclone.	30		15	5	3
5	Navigation	Dead Reckoning, Coastal Navigation, Position lines and Positions, Sailings, Information from charts, list of lights and other publications, Chartwork Exercises.	15		30	3	1
6	Control Engineering	Models for dynamical systems, analysis and design methods for continous-time and nonlinear systems, PID control, relay regulators, digital control, optimal, adaptive and game control systems, automation of ship control processes, artificial intelligence methods in marine navigation.	30		30	5	13
7	Marine Power Plants	Marine power plants functioning principles and construction:-power plants layout and configuration; -propulsion systems; -main engines; -diesel generators; -auxiliary equipment (steering gears, controllable pitch propellers, bow thrusters, steam boilers, pumps, compressors, biological savage treatment plants, oily water separators, fresh water generators, fuel oil separators).	30			2	6
8	Information Technology	Introduction to Database Management Systems.Word processing. E-mail Technology. Introduction to Computer Networks.	15		30	2	1
9	Navigational Equipment	Satellite Navigation Systems: GPS, DGPS, SBAS, GLONASS, Galileo Compass, Terrestrial Radionavigation Systems ? Loran C. Reference Coordinate Systems, Time, Hydroacoustics, Echosounder.	30		30	4	1
10	Sports	Teaching to swim butterfly.		15			23

## FACULTY OF NAVIGATION

**Summer semester (IV); SUM of ECTS: 30**

No.	Course title	Description	A	C	L	ECTS	Unit
1	Celestial Navigation	The algorithmization of computations on celestial navigation. The estimation of accuracy of astronomical observations and calculation of precision of celestial fix.	10	10		4	1
2	Construction And Stability Of Ship	Ship strength, ship equipment.	20		10	3	2
3	Maritime Transport Economics	Maritime transport and its functions in the global economy. Costs in maritime transport companies and their classifications. Charging schemas and practices; freight indices. Freight markets - their dynamic and methods of their analyses. Shipping policy and regulation schemas in maritime sector.	20			1	4
4	English	General English: Maritime English- Cargo Handling Gear. Containerization. Standard Marine Communication Phrases. MarEng. SMCP		30		2	24
5	Navigation	Great Circle, Rhumb Line, Accuracy Standards for Navigation, Chartwork Exercises.	10		20	3	1
6	Sea Enviromental Protection	Sea Environments Protection' course gives overview of the situation of sea ecosystems and how to manage and protect it.	20			1	14
7	Maritime Law	Public maritime law. Maritime administration, (maritime office), maritime chambers, safety at sea, protection and preservation of marine environment. Maritime labour law. Elements of polish labour law, International Labour Organization, conventions ILO. International law of the sea (UNCLOS, territorial sea, innocent passage, straits, e. e. z, high sea area).	30			2	2
8	Cargo Handling And Stowage	The technical application of transportation science based on current trends is presented. During the lectures the most important properties of some group of cargoes connected with their safe transportation are discussed.	20		20	3	2
9	GIS - ECDIS	GIS - Definition, Vector Data versus Raster Data, Data Display, International standards for ECDIS, main Types of ECS, ECDIS Data, main Functions of ECDIS, Presentation of ENC, Navigational sensors, Route Planning, Route Monitoring, Special Functions, Data Updating, Alarms and Indications, Malfunction of ECDIS, System Integrity, Back-up Arrangements, System Limitations.	10		20	2	1
10	Navigational Equipment	Basic radar principles, radar system – operational principles and controls, false and unwanted radar responses. Radar navigation, radar beacons, passive and active radar reflectors	20		10	3	1
11	Sports	Teaching water life-saving techniques.		10			23
12	Navigational Practice					6	1

## FACULTY OF NAVIGATION

**Fall semester (V); SUM of ECTS: 30**

No.	Course title	Description	A	C	L	ECTS	Unit
1	Construction And Stability Of Ship	Statical and dynamical stability of merchant ships.	30		30	4	2
2	English	General English: Maritime English - Tides. Ship's Deck Log Book. Collision Regulations. Ship's Safety Equipment-Alarms and Drills. Sea Environment – Pollution Prevention. SMCP		45		2	24
3	Sea Communication	Principles and Basic feature of the maritime mobile service, The Inmarsat system (standard B,C,M, Fleet F77), Global Maritime Distress and Safety System	30		30	3	2
4	Shiphandling	Basic maneuverability theory, ship maneuverability characteristics, major rules of shiphandling, IMO maneuverability standards.	30		30	3	2
5	Navigation	Magnetic Compass compensation, magnetic Variation, Tides and Tidal Streams, Definition – Earth, Charts, Datums, Compass correction, Distances, Chartwork Exercises.	30	30		4	1
6	Maritime Law	Maritime civil law. Seagoing vessel, polish nationality of vessel, registers of ships, maritime liens, mortgages, shipmaster, ship's operator and his liability, maritime contracts (carriage of cargo, carriage of passengers, time-charter, ship's agent, shipbroker, towage, pilotage, maritime salvage). General average, collision of vessels, recovery of property from the sea, wrecks removal. Maritime insurance (contract of marine insurance, floating insurance, insurance cargo, casco, P&I clubs).	30			2	2
7	Cargo Handling And Stowage	Carriage of goods and port operations of bulk (Dry and Liquid) cargoes.	30		30	4	2
8	Ship Safety Management And Operation	LSA Code, Ship Grounding Analysis, Underway Shipboard Emergencies: Fire, Abandon Ship, Man Overboard, Drills at Sea, Search and Rescue.	30		30	3	2
9	B.Sc. Thesis Seminar	Logic structure of B.Sc. thesis. Goal definition. Source search. Partial and final presentation.		15		1	-
10	Navigational Equipment	Target detection and radar range equation. Use of radar for anti-collision purposes, radar plotting aids, ARPA and ATA – specified and additional facilities.	30		30	4	1
11	Sports	Long distance swimming.		15			23

## FACULTY OF NAVIGATION

**Summer semester (VI); SUM of ECTS: 30**

No.	Course title	Description	A	C	L	ECTS	Unit
1	Construction And Stability Of Ship	Damage stability of ship.	26		26	3	2
2	English	General English: Letter Writing. Maritime English- Electronic Charts. Medical Service at Sea. Communication-GMDSS. IMDG Code. Ports and Cargo Handling Facilities. SMCP		39		2	24
3	Sea Communication	Maritime Safety Information, GMDSS satellite distress urgency and safety communication procedure, GMDSS terrestrial, distress, urgency and safety communication procedures.	26		26	3	2
4	Colreg	Remaining Colreg Rules regarding relations between ships in good and restricted visibility, examples of ships collisions, structure and methods of works sea courts (also in Poland), exercises on the simulator – application Colreg rules in sea passage.	26		13	2	1
5	The Humanities	Elements of management psychology and sociology: The psycho-sociological background of the functioning of a sea-going vessel crew; avoiding and solving interpersonal conflicts. Corporate behaviours: Corporate culture – the external and internal determinants of individuals' behaviours in an organisation. Human resource management (management style, authority, influences, leadership).	26			2	18
6	Navigation	Route Planning, Ocean Routes, Weather Navigation, Voyage Passage, Checklists, Restricted Waters, Route Optimization, Navigational Calculations, WGS-84, Integrated Navigational Systems.	26		26	3	1
7	Cargo Handling And Stowage	Stowage and securing different cargoes (general cargo, ro-ro, container's specialized cargoes, etc.) on board specialized vessel and organization of loading/discharging operations.	26		26	3	2
8	B.Sc. Thesis Seminar	Logic structure of B.Sc. thesis. Goal definition. Source search. Partial and final presentation.			13	1	-
9	Navigational Equipment	Use of radar for SAR purposes. INS, IBS and (S)VDR. VTS and SMS.	13		26	2	1
10	Basic Seamanship	Ship's cargo handling appliances, deck openings, maintenance, routine and emergency procedures	13			1	2
11	Monographic Lecture - Navigation		26			1	1
12	Ship Management	Ship documents, ship operation.	26	13		3	2
13	Shiphandling Practice					4	1

## FACULTY OF NAVIGATION

**Fall semester (VII); SUM of ECTS: 31**

No.	Course title	Description	A	C	L	ECTS	Unit
1	Celestial Navigation	Raport about sea practice.			10	2	1
2	Construction And Stability Of Ship	Raport about sea practice.			10	2	2
3	Meteorology And Oceanography	Raport about sea practice.			10	2	3
4	Colreg	Practical application of Colreg rules, basis on the students' reports from onboard training, study of Collision reports.			10	2	1
5	Navigation	Raport about sea practice.			10	2	1
6	Thesis					15	-
7	Cargo Handling And Stowage	Raport about sea practice.			10	2	2
8	Navigational Equipment	Raport about sea practice.			10	2	1
9	Ship Management	Raport about sea practice.			10	2	2