



PROGRAMME OF STUDIES	
SEM 1-7 B.Sc PROGRAMME	FACULTY OF NAVIGATION
	SECTION: TRANSPORT
	GROUP: PORT & FLEET EXPLOITATION

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
9	Department of Engineering Sciences
10	Department of Marine Maintenance
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	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, relativity, the wave nature of particles, quantum mechanics, atomic structure, nuclear and particle physics. Laboratory: performing physics experiments according to the subject of lectures.	30		30	5	12
2	Geography Of Transport	Transportation and Geography. Transportation and the Spatial Structure. Transportation Modes. Transportation Terminals. International Trade and Freight Distribution. Urban Transportation. Transport and the Economy. Transport and the Environment. Transportation Planning and Policies.	30			2	3
3	Engineering Graphics	Lecture: Descriptive geometry - elements of space, dependences between them, methods of projecting. Engineering drawing- standardization in engineering drawing, diagram of technical installations, management of engineering documentation, computer aided design. Laboratory: Descriptive geometry – Monge’s projection. Engineering drawing - axonometric and orthogonal projections of solids, engineering drawings of technical installations and elements of machines.	15		15	3	9
4	English	General English. Maritime English- Ship's Structure.		30		2	24
5	German	General German. Maritime German – selected issues in pre-intermediate, intermediate and upper-intermediate groups.		30		2	24
6	Mathematics	Basic topics of algebra: complex numbers, matrixes and determinants, systems of liner equations. Analytical geometry. Mathematical analysis: differential and integral calculus	45	30		5	5
7	Applied Mechanics	Statics (plane and spatial problems). Kinematics and dynamics of particle. Strength of materials (tension, shear, torsion, bending, and stability problems).	30	30	15	7	4
8	Natural Basics Of Planning And Port Exploatation	The influence of the environmental elements on port construction and exploitation.	30	30		4	3
9	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		0	23

## FACULTY OF NAVIGATION

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

No.	Course title	Description	A	C	L	ECTS	Unit
1	Occupational Safety And Health Management	Safety of work during on board vessels and port/terminal operations.	15			2	2
2	Port Hydro-Technical Structures And Water Area	Description: Materials of construction: concrete and steel, Ground parameters, Loading of hydro technical structures – ground and water pressure, wave forces, stability of structure.	30	30	15	4	4
3	English	General English. Maritime English- Meteorological Terms. Weather Forecasts.		30		2	24
4	German	General German. Maritime German – selected issues in pre-intermediate, intermediate and upper-intermediate groups.		30		2	24
5	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		5	5
6	Material Science	Metals and alloys. Fundamentals of metal properties. Iron – carbon system. Basic of thermal treatment of metals. Non ferrous metal alloys. Non metallic	30		15	3	10
7	Fundamentals Of Machine Construction	The chosen issues of fundamentals of machine joint and power transmission elements design. The chosen problems of tribology and fatigue strength.	30		15	4	9
8	Basics Of Economis	Fundamentals of micro and macroeconomics, for example, consumer bahaviour, 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
9	Sports	Swimming-pool: Teaching to swim freestyle. Gym hall: Improvement of skills in team oriented games (basketball, volleyball, football etc.).		30		0	23
10	Practice					6	4

## FACULTY OF NAVIGATION

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

No.	Course title	Description	A	C	L	ECTS	Unit
1	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		15	2	13
2	Basic Principle Of Electronics	Basic definitions, construction and rules of working of several electronic components and circuits. Basics of analogue and digital technique.	15		15	2	1
3	Informatics	Data representation. Programming in Pascal. Introduction to object programming	30		30	5	1
4	Transport Infrastructure	Presentation of the main characteristics and parameters of the transport infrastructure. Indication of the modal specific concern infrastructure. The state-of-art and future development plans of the European transport infrastructure. The financial aspects of the infrastructure development (incl. national budget structure, PPP, European Funds assistance).	15	30		4	4
5	English	General English. Maritime English- Modes of Transport. Types of Ships. Types of Cargo.		30		2	24
6	German	General German. Maritime German – selected issues in pre-intermediate, intermediate and upper-intermediate groups.		30		2	24
7	Cargo Science	During the lectures the most important factors of cargoes are presented. The relations between properties and method of transportation some goods and the application of advanced technologies in transportation are discussed.	30		30	3	2
8	Metrology Of Geometrical Forms.	Units of measure. Errors of measure, estimate and observation. Measurements of cones, screws, angels, gears and roughness	15		15	2	10
9	Basics Exploitation Of Machines	Models in exploitation of machines. Elements of trybology, friction and lubrication. Principles modeling and simulation. Operational reliability and maintainability. Structures of machines in reliability. Elements and principles of diagnostic machines.	30	15		4	9
10	Land, Inland And Air Transport Vehicles	Elements highway engineering, vehicles and buildings. Railway transport, rolling stock: vehicles and wagons. Air transport engineering: airports, airways, runways, air crafts. Instrument Landing Systems. IATA and ICAO code. Air containers. Pipelines transport. Gas and petroleum pipelines.	30	15		4	9
11	Sports	Teaching to swim butterfly.		15		0	23

## FACULTY OF NAVIGATION

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

No.	Course title	Description	A	C	L	ECTS	Unit
1	Operational Research	Optimization models, decision variables and goal function, constraints. Canonical form of the model. Dual form of the model. Sensitivity of the model. Simplex method. Transportation, assignment and related problems. Discrete optimization. Algorithms complexity. NP-complete class of problems. Greedy methods. Branch and bound method. Metaheuristics. Genetic and population learning algorithms. Individuals and operators. Graphs and networks. Shortest path and maximal flow problems. Salesman problem. Introduction to simulation. Multi-criteria decision problems. ELECTRE method. TOPSIS approach.	30		30	3	1
2	Construction And Stability Of Ship	Dimensions and hydrostatic dates, calculation of ship parameters, construction and equipment of merchant ships.	30	15		2	2
3	Transport Economics	The economic nature and character of transport processes. Transport costs and charging schemas for transport services. Transport markets and their regulation schemas.	30			3	4
4	Elements Of Law	Basic Theory of Law and State. Conception of state and law. Type of norms. Elements of Polish constitutional administrative, penal and civil law	30			1	2
5	English	General English. Maritime English- Sea Transport. Packing. Containerization. Cargo Damage.		30		2	24
6	German	General German. Maritime German – selected issues in pre-intermediate, intermediate and upper-intermediate groups.		30		2	24
7	Control Engineering	Models for dynamical systems, analysis and design methods for continuous-time and nonlinear systems, PID control, relay regulators, digital control, optimal, adaptive and game control systems, automation of fleet and port operations, artificial intelligence methods in fleet and port operations.	30		15	3	13
8	Basic Navigation	Chartwork. Introduction to use of electronic navigational aids. Communications.	30	30		2	1
9	Land, Inland And Air Transport Vehicles	Elements highway engineering, vehicles and buildings. Railway transport, rolling stock: vehicles and wagons. Air transport engineering: airports, airways, runways, air crafts. Instrument Landing Systems. IATA and ICAO code. Air containers. Pipelines transport. Gas and petroleum pipelines.	30	15		3	9
10	Information Technology	Introduction to Database Management Systems. Word processing. E-mail Technology. Introduction to Computer Networks.	15	15		2	1
11	Sports	Teaching water life-saving techniques.		15		0	23
12	Practice					7	4

## FACULTY OF NAVIGATION

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

No.	Course title	Description	A	C	L	ECTS	Unit
1	Port Structure And Exploitation	Seaports - general considerations: definition, classifications, and function. Basic measures of seaports: ship's dimensions, port's trans-shipment. Port's infrastructure and superstructure: spatial configuration of functional elements of a port. Planning and designing of port's water area: access channels, anchorages, port's entrances, inner channels, turning circles, basins, docks. Designing of berthing line and chosen elements of territory: general cargo terminal, container terminal, ro-ro and ferry terminals, dry-bulk terminals, liquid-bulk terminals.	30	30		4	4
2	Construction And Stability Of Ship	Intact stability and damage stability of ships.	15	30		3	2
3	Seaports Economics	The role and relevance of seaports in the economy – global approach. Systems and models of ports administration and management. Markets of seaports services – models of market's equilibrium and disequilibrium.	30	30		3	4
4	English	General English. Maritime English- Cargo Operations in Ports. Loading and Discharging.		30		2	24
5	German	General German. Maritime German – selected issues in pre-intermediate, intermediate and upper-intermediate groups.		30		2	24
6	Maritime Economic Law	Conception of economic law and maritime economic law. Elements of Polish economic law. Ports law. Maritime services (agency, pilotage, towage maritime salvage). Elements of International Commercial Law. Maritime insurance.	30			2	2
7	Technical Port Equipment	Structure and principles exploitation equipments and machines of ports and terminals: overhead traveling cranes, conveyors, loading/unloading machines, container trucks, carriers. Elements of cargo lift devices: ropes, spreaders, grabs, clamps. Hydraulic systems and elements: pumps, valves, filters	30		30	4	2
8	B.Sc. Thesis Seminar	Logic structure of B.Sc. thesis. Goal definition. Source search. Partial and final presentation.		15		1	-
9	Transport Systems		30	30		6	4
10	Cargo Handling Warehousing And Carriage Of The Goods	Carriage of goods and port operations of bulk (dry and liquid) cargoes.	15	30		3	2

## FACULTY OF NAVIGATION

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

No.	Course title	Description	A	C	L	ECTS	Unit
1	Port Structure And Exploitation	Designing of port's terminals (infrastructure, storage facilities, cargo-handling systems, inter-transport system) : general cargo terminal, container terminal, ro-ro and ferry terminals, dry-bulk terminals, liquid-bulk terminals.	30	30		4	4
2	English	General English. Maritime English- Port services- Pilotage. Towing services. Port Clearance. Cargo Handling Equipment.		30		2	24
3	German	General German. Maritime German – selected issues in pre-intermediate, intermediate and upper-intermediate groups.		30		2	24
4	Logistics	The definition, origin and main characteristics of logistics. Basic rules and kinds of logistics systems. Logistics of delivery, production and distribution, main challenges and solutions. Spatial planning of logistics systems location and development. Characteristics and management of the integrated logistics chains/networks. The role of transport in logistics management.	30	15		5	4
5	Logistics And Management	Organization and Management concerns the realization of the following issues: an organization as a subject of management, the system of administration and management of ports and maritime enterprises, the process of decision making, management functions: planning, organizing, directing, controlling, and also developing an organization.	30	15		4	15
6	Vessel Traffic Engineering	Main tasks of traffic engineering, characteristics of canals and fairways, port approaches & harbours, VTS functioning.	30	15		4	2
7	Technical Port Equipment	Structure and principles exploitation equipments and machines of ports and terminals: overhead traveling cranes, conveyors, loading/unloading machines, container trucks, carriers. Elements of cargo lift devices: ropes, spreaders, grabs, clamps. Hydraulic systems and elements: pumps, valves, filters	30		30	4	2
8	B.Sc. Thesis Seminar	Logic structure of B.Sc. thesis. Goal definition. Source search. Partial and final presentation.			15	1	-
9	Cargo Handling Warehousing And Carriage Of The Goods	Principles of port and board operations and warehousing of general cargo, ro-ro, containers and other cargoes.	30	15	15	4	2

## FACULTY OF NAVIGATION

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

No.	Course title	Description	A	C	L	ECTS	Unit
1	English	General English. Maritime English- Ship's Documents: Mate's Receipt, Bill of Lading, Charter Party.		20		2	24
2	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).	30			3	18
3	Environmental Protection	The subject of lectures is the anthropogenic changes in atmosphere, soils and water; mainly the sources of pollution from ships to sea environment.	20			2	14
4	Thesis					15	-
5	B.Sc. Thesis Seminar	Logic structure of B.Sc. thesis. Goal definition. Source search. Partial and final presentation.			10	2	-
6	Forwarding	The role of the freight forwarding in the contemporary international trade. Influence of customs of trade for the work of the forwarder.	20	10		2	4
7	Ship Management	Ship documents, ship operation.	20	10		2	2
8	Monographic Lecture - Transport		20			2	4