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Study guide

Bachelor in Marine Engineering

Academic year 2021-2022

First year bachelor in marine engineering

Mandatory subjects	Th/Pr	UC
Nautical Faculty		
SHIP TECHNIQUE (PART 1)	**36/24**	**3**
Safety techniques - theory	24/-	1
Safety technology - exercises	-/12	1
Fire safety - theory & Fire safety - exercises	12/12	1
Science Faculty		
MATHEMATICS	**36/36**	**8**
Mathematics	36/36	8
INFORMATICS	**-/48**	**5**
Informatics	-/48	5
MATTER AND MATERIALS (PART 1)	**24/-**	**3**
	24/-	3
MARITIME MEDICINE	**18/6**	**3**
Maritime medicine	18/6	3
MARITIME ENGLISH (PART 1)	**24/24**	**5**
Maritime English (part 1)	24/24	5
Faculty of Marine Engineering		
GENERAL ELECTRICITY	**30/24**	**6**
Introduction to electricity	12/12	3
Alternating current theory	18/12	3
SHIP'S DIESEL ENGINES (PART 1)	**24/-**	**4**
Ship's diesel engines (Part 1)	24/-	4
THERMODYNAMICS (PART 1)	**36/-**	**4**
Thermodynamics (Part 1)	36/-	4
TECHNICAL DRAWING, WORKSHOP PRACTICE (PART 1)	**-/96**	**5**
Technical drawing	-/48	3
Workshop practice (part 1)	-/48	2
ON BOARD TRAINING	**-/-**	**5**
On board training	-/-	5
SHIP CONSTRUCTION AND MATTER AND MATERIALS (PART 2)	**36/6**	**6**
Ship construction	12/-	2
Matter and materials (part 2)	24/6	4
STEAM INSTALLATIONS (PART 1)	**24/-**	**3**
Steam installations (part 1)	24/-	3

Elective subjects

Faculty of Science

MARITIME ENGLISH (REFRESHER COURSE)	**-/24**	
Maritime English refresher course	-/24	-

Second year bachelor in marine engineering

Mandatory subjects	Th/Pr	UC
Nautical Faculty		
SHIP TECHNIQUE (PART 2)	**36/12**	**4**
Dangerous goods	12/-	1
Basic tanker training (oil, gas, chem) & IGF - theory & Basic tanker training (oil, gas, chem) & IGF - exercises	24/12	3
Science Faculty		
GENERAL MECHANICS	**48/-**	**4**
General mechanics	48/-	4
HYDROMECHANICS AND RESEARCH METHODOLOGY	**30/-**	**3**
Hydromechanics	24/-	2
Methodology of scientific research	6/-	1
MARITIME ENGLISH (PART 2)	**24/12**	**4**
Maritime English (part 2)	24/12	4
Faculty of Marine Engineering		
THERMODYNAMICS (PART 2)	**30/-**	**4**
Thermodynamics (part 2)	30/-	4
SHIP'S AUXILIARY ENGINES (PART 1)	**24/-**	**6**
Ship's auxiliary engines (part 1)	24/-	6
STEAM INSTALLATIONS (PART 2)	**24/12**	**3**
Steam installations - theory	24/-	2
Steam installations - excercises	-/12	1
STRENGTH OF MATERIALS	**30/-**	**4**
Strength of materials	30/-	4
SHIP'S AUTOMATION (PART 1)	**24/8**	**4**
Ship's automation (part 1) - theory & Ship automation (part 1) - exercises	24/8	4
SHIP'S ELECTRONICS (PART 1)	**48/32**	**6**
Ship's electronics / digital techniques (part 1) - theory	24/-	2
Ship's electronics / analogue techniques (part 1) - theory	24/-	2
Ship's electronics (part 1) - practice	-/32	2
SHIP'S ELECTROTECHNICS (PART 1)	**48/56**	**8**
Ship's electrotechnics (part 1) - theory	48/-	4
Ship's electrotechnics (part 1) - practice	-/32	2
Pneumatics - exercises	-/8	1
Sequential systems and PLC-systems	-/16	1
SHIP'S DIESEL ENGINES (PART 2)	**24/-**	**4**

Ship's diesel engines (part 2)	24/-	4
MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1)	**-/48**	**3**
Multidisciplinary simulator exercises (part1)	-/48	3
WORKSHOP PRACTICE (PART 2)	**-/48**	**3**
Workshop practice	-/48	3

Third year bachelor in marine engineering

Mandatory subjects	Th/Pr	UC
Nautical Faculty		
SHIP TECHNIQUE (PART 3)	**78/-**	**7**
Ship safety	12/-	2
ISPS & ISM	30/-	1
Stability	12/-	1
Maritime ecology and environmental regulations	12/-	2
Ship's administration and maritime law	12/-	1
Science Faculty		
ECONOMIC EVALUATION OF MAINTENANCE	**12/-**	**3**
Economic evaluation of maintenance	12/-	3
COMMUNICATION IN A MARITIME INTERCULTURAL CONTEXT	**24/-**	**3**
Communication in a maritime and intercultural context	24/-	3
MARITIME ENGLISH (PART 3)	**24/-**	**3**
Maritime English (part 3)	24/-	3
Faculty of Marine Engineering		
SHIP'S AUTOMATION (PART 2) + SIMULATOR TRAINING	**48/44**	**5**
Ship's automation (part 2) - theory & Ship's automation (part 2) - exercises	48/32	4
Ship's automation - simulator training	-/12	1
SHIP'S ELECTRONICS (PART 2)	**48/32**	**5**
Ship's electronics / Analogue electronics (part 2) - theory	24/-	2
Ship's electronics / digital techniques (part 2) - theory	24/-	2
Ship's electronics (part 2) - practice	-/32	1
SHIP'S ELECTROTECHNICS (PART 2) + SIMULATOR TRAINING	**24/48**	**5**
Ship's electrotechnics (part 2) - theory	24/-	2
Ship's electrotechnics (part 2) - practice and high voltage exercises on simulator	-/36	2
Ship's electrotechnics (part 2) - simulator training	-/12	1
SHIP'S DIESEL ENGINES (PART 3) + SIMULATOR TRAINING	**36/24**	**5**
Ship's diesel engines (part 3) - theory	36/-	3
Ship's diesel engines simulator training	-/24	2
SHIP'S AUXILIARY ENGINES (PART 2) INCLUDING IGF - SIMULATOR TRAINING	**24/24**	**5**
Ship's auxiliary engines (part 2) - theory	24/-	3
Ship's auxiliary engines (Part 2) including IGF - simulator training	-/24	2
MARITIME RESOURCE MANAGEMENT - MRM & MRM - CASE STUDIES	**32/-**	**3**
Maritime resource management - MRM	24/-	2

Maritime resource management - case studies	8/-	1
MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 2), WATCHKEEPING, WORKSHOP PRACTICE (PART 3) AND SEMINARS	**-/108**	**4**
Multidisciplinary simulator exercises (part 2) and watch keeping	-/60	2
Workshop practice (part 3) and seminars	-/48	2

Bachelor scription

BACHELOR SCRIPTION	**-/-**	**12**
Bachelor term paper	-/-	12

Elective subjects

Nautical Faculty

ADVANCED TANKER TRAINING OIL	**18/18**	
Advanced tanker training oil	18/18	-
ADVANCED TANKER TRAINING GAS & IGF	**18/18**	
Advanced tanker training gas & IGF	18/18	-
ADVANCED TANKER TRAINING CHEMICALS	**18/15**	
Advanced tanker training chemicals	18/15	-
ADVANCED FIRE FIGHTING & TANKER FIRE FIGHTING	**6/24**	**-**
Advanced fire fighting & Tanker fire fighting	6/24	-

* Course Fire safety only for students whose 1 bach ME/2 bach ME curriculum did not yet contain Fire safety

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ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 1) (3 UC)**
Course element	**Safety techniques - theory**
Lecturer(s)	**Inez HOUBEN**
Lecturer in charge	Marieke UTEN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	This course is divided into three parts. The first part gives an introduction to maritime safety, the function of the IMO and the SOLAS convention are explained. Chapter 3 of the SOLAS convention - life saving appliances- is discussed in detail. In the second part the contents of Chapter VI of the STCW code are covered, being 'familiarisation", "basic safety" and "proficiency in survival craft". In the third part of the course de basic elements of "security awarenss" of the ISPS code are explained.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Co-ordinate operations and activities during 'first intervention' and correctly apply fire detection and safety system procedures. (BA-SW-3) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)			
Examination	**Following Module 1.1**	**Following Module 1.2 written exam**	**Following Module 2.1**	**Following Module 2.2**
	Second session written exam			
Required study material	Lecturer's course text available.			

Recommended preliminary competences	
Additional information	- International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO.

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ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**SHIP TECHNIQUE (PART 1) (3 UC)**
Course element	**Safety technology - exercises**
Lecturer(s)	**Inez HOUBEN, Klaas DE HERT**
Lecturer in charge	Marieke UTEN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	-/12			
Semester + module(s)	**Semester 1, Module 1.1 -/12**	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			

Course content	During practical sessions following items are trained: Life boat and life raft handling: - take charge during and after launch; - operate a survival craft engine; - train lifeboat launching; - train procedures while on board life rafts or lifeboats; - righting a capsized raft; - rescue and survival techniques without a life raft. Train and discus location devices: - signalling apparatus; - pyrotechnics as flares and other emergency beacons. Train and discus all different personal life saving appliances: - properly wearing and using lifejackets, survival suits; - safe working practices with all correct PPE; - ability to understand orders and to communicate with others in relation to shipboard duties. Train and discuss first aid equipment: - actions in emergencies; - basic life support & CPR; - treatment for wounds, bleeding, burns, scalds, shock, fractures, dislocations and soft tissue injuries; - hypothermia.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Co-ordinate operations and activities during 'first intervention' and correctly apply fire detection and safety system procedures. (BA-SW-3) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1 permanent evaluation** / **Following Module 1.2** / **Following Module 2.1** / **Following Module 2.2** **Second session second session impossible**
Required study material	Lecturer's course text available. Safety clothing.
Recommended preliminary competences	
Additional information	- International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - International Maritime Organization. (latest ed.). *Pocket guide to cold water survival.* Londen, UK: IMO.

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ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 1) (3 UC)**
Course element	**Fire safety - theory &** **Fire safety - exercises**
Lecturer(s)	**Raf MESKENS** **Inez HOUBEN, Baziel SPITAELS**
Lecturer in charge	Marieke UTEN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture Practical exercises			
Other teaching methods	Excursion Group work Demonstration			
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	12/12			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2** **12/-**	**Semester 2, Module 2.1** **-/6**	**Semester 2, Module 2.2** **-/6**
Learning objectives	At the end of the course, the student is expected to be able to:			

Course content	This is a course on marine fire fighting. Prevention, development, detection and extinguishment of a fire are discussed. The course is based on the SOLAS convention chapter II-2 and the FSS code. The student receives a basic fire fighting training. The following issues are covered: - breathing apparatus: the students learn how to perform the correct procedure and checks, name the various components, quickly connect and disconnect their airsupply, correct and quick assembly and use; - progressing in group: understanding why and how to do this, necessity for good communication between team members, performing a correct stairs procedure; - fire hoses: unrolling, emptying and rolling up fire hoses correctly; - fire hose management: correctly align and connect fire hoses, place manifolds correctly and how to connect them; - fire nozzle techniques and "water management": importance of water management and the correct operation of the fire nozzles; - victim evacuation: carrying out a search and rescue and performing correct carrying techniques (with BA set) to evacuate victims; - apply door procedures correctly; - making an efficient foam arrangement; - small extinguishing means: distinguish different fire extinguishers, limitations and characteristics, correct operation of extinguishers; - use of a fire blanket on a fryer and person; - EEBD (different types); - take immediate appropriate action in the event of a fire (fire classes); - organization in fire fighting team: group collaboration, assertiveness, communication and allocation of tasks.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Co-ordinate operations and activities during ‘first intervention’ and correctly apply fire detection and safety system procedures. (BA-SW-3) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** **Following Module 1.2** **written exam** **Following Module 2.1** **permanent evaluation** **Following Module 2.2** **permanent evaluation** **Second session** **written exam** **second session impossible**
Required study material	Lecturer's course text available. Safety clothing.
Recommended preliminary competences	

Additional information	- International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (2000). *International Code for Fire and Safety Systems, 2000, as amended*. London, UK: IMO.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**MATHEMATICS (8 UC)**
Course element	**Mathematics**
Lecturer(s)	**Marc VERVOORT**
Lecturer in charge	Marc VERVOORT
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	8			
Hours of formal lecture/practical exercise	36/36			
Semester + module(s)	**Semester 1, Module 1.1 12/6**	**Semester 1, Module 1.2 6/12**	**Semester 2, Module 2.1 12/6**	**Semester 2, Module 2.2 6/12**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Limits and continuity. Derivatives of algebraic, trigonometric, inverse trigonometric, exponential and logarithmic functions. Implicit and higher order derivatives, differential. Applications of derivatives: extremal values, inflection points, equation of the tangent line, velocity, etc. Partial derivatives, partial and total differential. Taylor series with remainder term, l'Hôpital's rule. Complex numbers. Indefinite integrals and integration methods. Definite integrals and applications: areas, volumes, centres of gravity, moments of inertia. Differential equations of first and second order. Laplace transforms, Fourier series. Numerical integration methods. Introduction to vector calculus: vectors in a plane, vectors in a space. In this course students acquire the necessary mathematical skills in support of other subjects, such as physics, strength of materials, mechanics, ship's electronics and ship's electrical engineering, ship's automation, stability.			

Learning outcomes	- Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)
Examination	Following Module 1.1 - **Following Module 1.2** **written exam** Following Module 2.1 - **Following Module 2.2** **oral exam with written preparation** **Second session** **oral exam with written preparation**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	Mathematics
Additional information	- Ayres, F., & Mendelson, E. (2013). *Schaum's outlines calculus*. Schaum's outline series (6th ed.). New York, US: McGraw-Hill. - Chilov, G. (1975). *Analyse mathématique.* Moscou, URSS : Editions MIR. - International Maritime Organization. (2014). *Model course 7.04: Officer in charge of an engineering watch.* London, UK: IMO. - Piskounov, N. (1968). *Calcul différentiel et intégral*. Moscou, URSS : Editions MIR.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**INFORMATICS (5 UC)**
Course element	**Informatics**
Lecturer(s)	**Tim COOLS**
Lecturer in charge	Tim COOLS
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	5			
Hours of formal lecture/practical exercise	-/48			
Semester + module(s)	**Semester 1, Module 1.1 -/12**	**Semester 1, Module 1.2 -/12**	**Semester 2, Module 2.1 -/12**	**Semester 2, Module 2.2 -/12**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The aim of this course is to familiarize the students with the use of a computer, in particular with practical applications and software. The focus of the course is on an advanced study of applications that are frequently encountered in the professional maritime context. The student masters a number of mainstream software packages, like Microsoft Windows, Word, Excel and PowerPoint, compression software WinZip and 7zip. The student obtains a basic knowledge of drawing software or image editing like for instance Visio and/or AutoCAD and/or Irfanview or in Office. The student is capable of using of the world wide web as an important source of information, and manages the acquired information efficiently. The student learns basic programming and boolean algebra with the use of for example Arduino. The student is able to apply the basic principles computer networks on ships The student is capable of assembling a computer system and installing an operating system.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Administer computer networks on board. (BA-SW-9) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)
Examination	**Following Module 1.1 permanent evaluation** | **Following Module 1.2 permanent evaluation** | **Following Module 2.1 permanent evaluation** | **Following Module 2.2 permanent evaluation** **Second session practical test**
Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**MATTER AND MATERIALS (PART 1) (3 UC)**
Course element	
Lecturer(s)	**Joeri HORVATH**
Lecturer in charge	Geert POTTERS
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	In the courses of Matter and Materials, students identify the physicochemical properties of all kinds of materials and learn to predict from the properties of the atomic and molecular particles how substances behave on a macroscopic level. In the beginning of this course, the student learns to name and use the basic concepts from general chemistry, along with basic concepts from physics, to understand the behavior of more complex materials. The student practices to use the language of the chemical equation correctly and solves simple stoichiometric problems, also in the gas phase and for ionic reactions. The course then discusses the properties of atoms, bonds between atoms to molecules, crystal lattices of metals and ionic compounds. Gradually, the student gains insight into the Mendeleev Table as a basic instrument for classifying the properties of elements. This is further explored with the general gas law to describe the behavior of gases, and with the iron-carbon diagram as an example of crystalline solids such as steel. Finally, material properties of metals such as hardness and strength are also explained from this microscopic organization.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** / **Following Module 1.2 oral exam with written preparation** / **Following Module 2.1** / **Following Module 2.2** **Second session oral exam with written preparation**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**MARITIME MEDICINE (3 UC)**
Course element	**Maritime medicine**
Lecturer(s)	**Rob VERBIST**
Lecturer in charge	Rob VERBIST
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	18/6			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **12/-**	**Semester 2, Module 2.2** **6/6**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	First aid, level assistant. Special attention for wound care, fractures, bleeding, burns, drowning, CPR and shock. General pathology: introduction on the human body, respiratory diseases, cardiovascular diseases, abdominal diseases, sexually transmitted diseases, back problems, sea sickness, malaria and quarantaine disease, psychological problems. Occupational pathology and prevention: physical and chemical risks onboard, drugs and alcohol, vaccinations, food and hygiene. Use of the ship's medicine chest and Radio-medical advice. Through lessons, practice and demonstrations the students gain the knowledge they need to give medical assistance on board according to the criteria included in the STCW95-code and the Manila Amendments 2010.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)
Examination	Following Module 1.1 - Following Module 1.2 - Following Module 2.1 - **Following Module 2.2** **oral exam with written preparation** **Second session** **oral exam with written preparation**
Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**MARITIME ENGLISH (PART 1) (5 UC)**
Course element	**Maritime English (part 1)**
Lecturer(s)	**Pieter DECANCQ, Alison NOBLE**
Lecturer in charge	Alison NOBLE
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods	Portfolio			
Instruction language	English			
Required preliminary credit(s)				
Units of credit (UC)	5			
Hours of formal lecture/practical exercise	24/24			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2 -/12**	**Semester 2, Module 2.1 12/6**	**Semester 2, Module 2.2 12/6**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content				
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)			

Examination	**Following Module 1.1**	**Following Module 1.2 permanent evaluation**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 oral and written exam**
	Second session oral and written exam			
Required study material	Lecturer's course text available. - Buckowska, W. (2014). *MarEngine English Underway.* Dokmar, the Netherlands. ISBN: 9789071500268. - International Maritime Organization. (2002). *Standard Marine Communication Phrases*. London, UK: IMO. ISBN: 9789280142112. - Murphy, R. (2004). *English Grammar in Use.* (4th ed.). Cambridge, UK: Cambridge University Press. ISBN: 97811075339334. - Murphy, R. (2004). *Essential Grammar in Use* (3rd ed.). Cambridge, UK: Cambridge University Press. ISBN 9781107480551. - Nisbet, A., Witcher Kutz, A. & Logie, C. (1997). *Marlins English for Seafarers, Study Pack 1*. Edinburgh, UK: Marlins. ISBN: 0 9531748 08. - Nisbet, A., Witcher Kutz, A. & Logie, C. (1998). *Marlins English for Seafarers, Study Pack 2*. Edinburgh, UK: Marlins. ISBN 0953174816. - Petkova, V. & Toncheva, S. (2016). *Correspondence and Communications in Shipping*. Varna, Bulgaria: Steno Publishing House. ISBN: 978-954-449-853-5. - Van Kluijven, P.C. (2007). *The International Maritime Language Programme*. Sint Pancras, the Netherlands: Alk & Heijnen Publishers ISBN: 9789059610064.			
Recommended preliminary competences				
Additional information	- International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended*. London, UK: IMO. - International Maritime Organization. (2002). Standard Marine Communication Phrases. London, UK: IMO.			

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**GENERAL ELECTRICITY (6 UC)**
Course element	**Introduction to electricity**
Lecturer(s)	**Rik FLOREN**
Lecturer in charge	Rik FLOREN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	12/12			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 -/12**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student will learn some basic skills in electricity: voltage, current, resistance, Ohm's law. The analysis of combined circuits using Kirchoff, Thévenin Norton and maximum power theorem. Fundamentals of magnetism.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1)			
Examination	**Following Module 1.1**	**Following Module 1.2 oral exam with written preparation**	**Following Module 2.1**	**Following Module 2.2**
	Second session oral exam with written preparation			
Required study material	Lecturer's course text available. Scientific calculator. - Hambley, A.R. (latest ed.). *Electrical Engineering, Principles and Application.* New York, USA: Pearson.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**GENERAL ELECTRICITY (6 UC)**
Course element	**Alternating current theory**
Lecturer(s)	**Rik FLOREN**
Lecturer in charge	Rik FLOREN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	18/12			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **12/-**	**Semester 2, Module 2.2** **6/12**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student acquires a basic knowledge and basic skills in AC-networks and electrical safety. Capacitor, inductor, combined circuits, transformers.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1**	**Following Module 2.2** **oral exam with written preparation**
	Second session **oral exam with written preparation**			
Required study material	Lecturer's course text available. Scientific calculator. - Hambley, A.R. (latest ed.). *Electrical Engineering, Principles and Application.* New York, USA: Pearson.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S DIESEL ENGINES (PART 1) (4 UC)**
Course element	**Ship's diesel engines (Part 1)**
Lecturer(s)	**Tim COOLS**
Lecturer in charge	Tim COOLS
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2** **12/-**	**Semester 2, Module 2.1** **12/-**	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student acquires a basic knowledge concerning the characteristics and the realisation of the marine diesel engines. The student demonstrates an understanding of - nomenclature of the main components of a ship's engine - characteristics such as dimensions, output power and specific consumption - the functioning of 2-stroke and 4-stroke engines - efficiencies and airfactors - introduction in turbocharging - cooling systems with marine diesel engines The student is able to - calculate the power with the aid of an P-V diagram			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15)
Examination	**Following Module 1.1** | **Following Module 1.2** | **Following Module 2.1 written exam** | **Following Module 2.2** **Second session written exam**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	
Additional information	- Briand, J. (2008). *Diesels marins*. Rennes, France: Infomer. - Kuiken, K. (2008). *Diesel Engines I & II.* Onnen, The Netherlands: Target Global Energy Training. - Van Maanen, P. (1992). *Scheepsdieselmotoren 1.* Harfsen, Nederland: Nautech. - Van Maanen, P. (1994). *Scheepsdieselmotoren 2.* Harfsen, Nederland: Nautech.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**THERMODYNAMICS (PART 1) (4 UC)**
Course element	**Thermodynamics (Part 1)**
Lecturer(s)	**Tim COOLS**
Lecturer in charge	Tim COOLS
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	36/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **24/-**	**Semester 2, Module 2.2** **12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			

Course content	The student demonstrates an understanding of -Conservation of mass and energy. -Open and closed systems. -Different forms of energy, as the internal energy U. -Revision of elementary principles, such as density, specific volume, the pressure, the temperature, etc… Introduction to thermodynamics. -The different phases and their representation in a diagram. -The TV and pV diagrams of a pure substance. -The first law for closed systems. Q=dU+pdV. The enthalpie formulas and tables. -Ideal and real gases and their location on a TV diagram. The ideal gas law and the law of Dalton. The first law of thermodynamics. -Conservation of mass. -The first law for closed systems. The internal energy is a function of the temperature for ideal gases. The product p.V is an energy. H=U+p.V is the energy content of a system. Q= dH if the pressure is constant. The polytropes -The pV diagrams for different polytropic transformations, by heating as well as by cooling. The pV diagram of an adiabatic expansion and an adiabatic compression. -R = cp - cv (the prove) -Comparison of the work W during an isothermic and adiabatic expansion and compression. -The formulas for the polytropic transformation, with the internal combustion motor as an example: the laws of Poisson, work and heat -The OTTO-cycle , pV-diagram and efficiency calculation. - heat exchange through conduction, convection and radiation. The different formulas. The insulator. - heat transfer through a complex wall, formula. Heat transfer for a general configuration. - radiation. The law of Stefan-Boltzman for a black body. The real body, the emission factor. the calculation of heat transfer in case of black bodies. - micro wave oven, the perfect mirror, the law of Kirchoff, the thermal shield. - calculations in case of a real situation. The student is able to use his acquired knowledge in practical calculations.

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)
Examination	**Following Module 1.1** | **Following Module 1.2** | **Following Module 2.1** | **Following Module 2.2 written exam** **Second session written exam**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	
Additional information	- Andre Houberechts. (1996). *La thermodynamique technique*. Bruxelles, Belgique: Vander. - Cengel, Y. (2009). *Introduction to thermodynamics and heat transfer.* New York, US: McGraw-Hill. - Cengel, Y., Boles M. *Thermodynamics - An Engineering Approach - SI Version (8th ed.)* - Kimmenaede. (2010). *Warmteleer voor technici*. Groningen, Nederland Noordhoff Uitgevers. - Moran, M., Shapiro, H., Boettner, D., Bailey, M. (2012). *Principles of Engineering Thermodynamics – SI Version (7th ed.).* Hoboken, N.J., US: Wiley.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**TECHNICAL DRAWING, WORKSHOP PRACTICE (PART 1) (5 UC)**
Course element	**Technical drawing**
Lecturer(s)	**Vincent LEYSEN**
Lecturer in charge	Stefaan BUEKEN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	-/48			
Semester + module(s)	**Semester 1, Module 1.1 -/12**	**Semester 1, Module 1.2 -/12**	**Semester 2, Module 2.1 -/12**	**Semester 2, Module 2.2 -/12**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student learns about technical drawings in a maritime context. This will enable him to read the technical plans and to produce his own correct drawings of spare parts. We learn the techniques first on paper, later with Autocad. Lecture of technical drawnings is essential for preparing maintenance. The candidate acquires competences in designing machinery parts. He learns basics about representing machinary parts and tolerances.			
Learning outcomes	- Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5)			
Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation with integrated practical test**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 permanent evaluation with integrated practical test**
	Second session written exam			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				

Additional information	- Giesecke, F.E. (latest ed.). *Engineering graphics*. US: Pearson Education Inc.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**TECHNICAL DRAWING, WORKSHOP PRACTICE (PART 1) (5 UC)**
Course element	**Workshop practice (part 1)**
Lecturer(s)	**Stefaan BUEKEN, Tim COOLS, Tim JANSSENS, Marc STERKENS**
Lecturer in charge	Stefaan BUEKEN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/48			
Semester + module(s)	**Semester 1, Module 1.1 -/12**	**Semester 1, Module 1.2 -/12**	**Semester 2, Module 2.1 -/12**	**Semester 2, Module 2.2 -/12**
Learning objectives	At the end of the course, the student is expected to be able to: - recognize, name and (dis)assemble internal and external parts of a diesel engine; - perform basic operations on a lathe; - to perform welding work in a horizontal plane; - reproduce gaskets; - determine and reproduce thread types; - correct measurements using perform a caliper.			

Course content	Dans le labo des traveaus pratiques, l'étudiant apprend à utiliser correctement et en toute sécurité les outils, instruments de mesure et machines (étrier, tour, perceuse, meule, outils à main, etc.) qui sont régulièrement utilisés par le mécanicien de marine à bord. L'étudiant démonte un moteur diesel et discute de ses composants, de son fonctionnement et de son (dé)assemblage. Il prend note du procédé de soudage SAEE et règle la machine à souder selon des valeurs données. Il produit une soudure et une soudure d'angle correctes. Il prend connaissance du tour et effectue les opérations de base (tournage cylindrique, dressage et perçage). De plus, l'étudiant apprend à démonter les équipements techniques à bord d'un navire de manière sûre et techniquement responsable (pompes à pistons, moteurs diesel, pompes diesel, vannes). Il peut évaluer l'état des pièces de ces machines/ équipements après avoir consulté les informations techniques disponibles. L'étudiant reproduit des joints selon le modèle avec les outils disponibles. Enfin, il apprend à associer et reproduire différents systèmes de filetage avec leur application et fonction.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Safely handle repair tools, hand over the watch and fully supervise fuel transfers. (BA-SW-6)
Examination	**Following Module 1.1 permanent evaluation** | **Following Module 1.2 permanent evaluation** | **Following Module 2.1 permanent evaluation** | **Following Module 2.2 permanent evaluation with integrated practical test** **Second session practical test**
Required study material	Lecturer's course text available. Safety clothing.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**ON BOARD TRAINING (5 UC)**
Course element	**On board training**
Lecturer(s)	**Willem MAES, Filip VAN GUTTE**
Lecturer in charge	Willem MAES, Filip VAN GUTTE
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Practical exercises
Other teaching methods	Excursion
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	5
Hours of formal lecture/practical exercise	-/-
Semester + module(s)	Semester 1, Module 1.1 -/- Semester 1, Module 1.2 -/- Semester 2, Module 2.1 -/- Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:
Course content	The student has a first contact with his future work environment.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15)

Examination	Following Module 1.1 -	Following Module 1.2 -	Following Module 2.1 -	**Following Module 2.2** **permanent evaluation or oral presentation of individual training on board**
	Second session **oral presentation of individual training on board**			
Required study material	Safety clothing.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP CONSTRUCTION AND MATTER AND MATERIALS (PART 2) (6 UC)**
Course element	**Ship construction**
Lecturer(s)	**Remke WILLEMEN**
Lecturer in charge	Geert POTTERS
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	12/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	**Semester 2, Module 2.2 12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	General description of a ship, stresses and damage investigation.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)			
Examination	Following Module 1.1 -	Following Module 1.2 -	Following Module 2.1 -	**Following Module 2.2 written exam**
	Second session written exam			
Required study material	Lecturer's course text available. Scientific calculator.			
Recommended preliminary competences				

Additional information	- AMACORT. (2017). The Economics of a Long Term Coating. *International Journal of Maritime Engineering (IJME)*, Transactions RINA, Vol 159, Part A3. DOI No: 10.3940/rina.ijme.2017.a3.416. - Eyres, D.J. & Bruce, G.J. (2012). *Ship Construction* (7th ed.). London, UK: Butterworth-Heinemann. ISBN: 9780080972398. - International Association of Classification Societies. (1997). *BULK CARRIERS - Guidance and Information on Bulk Cargo Loading and Discharging to Reduce the Likelihood of Over-stressing the Hull Structure.* London, UK: IACS. - International Association of Classification Societies. (2002). *BULK CARRIERS - guidelines for Surveys, Assessment and Repair of Hull Structures*. London, UK: Witherby & Co. ISBN: 1856092232. - International Association of Classification Societies. (2005). *Guidelines for coating maintenance and repairs*. London, UK: Witherby & Co. ISBN: 1856093085. - International Association of Classification Societies. (2011). *Classification Societies - What, Why and How?.* London, UK: IACS. - International Association of Classification Societies. (Rev. 2 May 2015). *Recommendation 87, Guidelines for coating maintenance & repairs for ballast tanks and combined cargo/ballast tanks on oil tankers*. London, UK: IACS. - International Maritime Organization. (2006). *Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers RESOLUTION MSC.215(82), as amended.* London, UK: IMO. - Lloyd's Register. (2002). *A Master's Guide to Hatch Cover Maintenance.* London, UK: The Standard. ISBN: 1856092321. - Lloyd's Register. (2014). *ESP Guidance booklet for all ship types in preparation for a special survey.* London, UK: LR. - Melchers, R.E. (1999). Corrosion uncertainty modelling for steel structures. *Journal of Constructional Steel Research*, 52, 3-19. Amsterdam, The Netherlands: Elsevier. - Oil Companies International Marine Forum. (1997). *Factors influencing accelerated corrosion of cargo oil tanks.* London, UK: OCIMF. - Tanker Structure Co-operative Forum. (2010). *Guidelines for the inspection and maintenance of double hull tanker structures*. Edinburgh, UK: Witherby Seamanship International. ISBN: 9781856090803. - Taylor, D.A. (1998). *Merchant Ship Construction* (4th ed.). London, UK: IMarEST. ISBN: 97819025636002. - van Dokkum, K. (latest ed.). *Ship Knowledge.* Enkhuizen, The Netherlands: Dokmar.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP CONSTRUCTION AND MATTER AND MATERIALS (PART 2) (6 UC)**
Course element	**Matter and materials (part 2)**
Lecturer(s)	**Joeri HORVATH**
Lecturer in charge	Geert POTTERS
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	24/6			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **12/-**	**Semester 2, Module 2.2** **12/6**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	In Matter and Materials 2, the student initially studies the chemical and physical properties of organic molecules. The student gets to know the most important groups of organic substances, in particular the hydrocarbons. By doing so, he / she understands the properties of marine fuels and lubricants, and how the quality of these substances can be analyzed. Subsequently, the student learns to recognize and classify the plastics and to explain their properties based on the composition. Fuel combustion links this course with the courses in Thermodynamics: the student applies the concepts of enthalpy, entropy and Gibbs' free energy to combustion reactions and their relatives. Then the student investigates the concept of equilibrium reactions and applies this general theory in describing and explaining acid-base reactions and redox reactions. He / she uses this knowledge when analyzing boiler waters on board ships. Finally, the student applies the seen concepts in understanding corrosion as a maritime phenomenon and the measures to combat it.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1** / **Following Module 2.2 oral exam with written preparation** **Second session oral exam with written preparation**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**STEAM INSTALLATIONS (PART 1) (3 UC)**
Course element	**Steam installations (part 1)**
Lecturer(s)	**Stefaan BUEKEN**
Lecturer in charge	Stefan BUEKEN
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	What is steam? What is the difference between wet steam, saturated an d superheated steam. Make calculations with steam-tables. The operation and construction of the different types of steam boilers. What are economizers and superheaters. What are the accessories we can find on a boiler. The way different steam turbines work. The use of streamturbines in the production of electicity and propulsion. some specific connections made in steam-circuits. Make energetic calculations on steam circuits and steam turbine circuits.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5)			

Examination	**Following Module 1.1**	**Following Module 1.2 written exam**	**Following Module 2.1**	**Following Module 2.2**
	Second session written exam			
Required study material	Lecturer's course text available. Scientific calculator.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**MARITIME ENGLISH (REFRESHER COURSE) (UC)**
Course element	**Maritime English refresher course**
Lecturer(s)	**Pieter DECANCQ, Christophe COLLARD**
Lecturer in charge	Alison NOBLE
Educational programme	**First year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	English			
Required preliminary credit(s)				
Units of credit (UC)	-			
Hours of formal lecture/practical exercise	-/24			
Semester + module(s)	**Semester 1, Module 1.1** **-/24**	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The course aims to refresh general knowledge and skills in English (reading, listening, writing and speaking skills). Grammar and elementary maritime vocabulary are taught as well. Furthermore, gradual familiarisation with maritime daily situations is encouraged by the texts in the course *Marlins English for Seafarers Study Pack 1* in order to mirror the General Maritime English section of *IMO Model Course 3.17 Maritime English 2015 edition*. The course is offered at two levels, one of which moves at a faster pace than the other.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13)			
Examination	**Following Module 1.1** **written exam**	Following Module 1.2 -	Following Module 2.1 -	Following Module 2.2 -
	Second session **second session impossible**			
Required study material	- Logie, C., Vivers, E. & Nisbet, A. (1998). *Marlins English for Seafarers Study Pack 1*. Edinburgh, UK: Marlins. ISBN: 0953174808. - Murphy, R. (2004). *English Grammar in Use* (4th ed.). Cambridge, UK: Cambridge University Press. ISBN 97811075339334.			

Recommended preliminary competences	Proficiency in General English is recommended
Additional information	- International Maritime Organization. (2002). *Standard Marine Communication Phrases.* London, UK: IMO. - Murphy, R. (1990). *Essential Grammar in Use* (3rd ed.). Cambridge, UK: Cambridge University Press. ISBN: 9780521675437.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 2) (4 UC)**
Course element	**Dangerous goods**
Lecturer(s)	**Geert POTTERS**
Lecturer in charge	Kris DE BAERE
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	12/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	**Semester 2, Module 2.2 12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	In this course, the student is introduced to the International Maritime Dangerous Goods Code (IMDG), the maritime regulations concerning the handling and transport of dangerous goods. After a general introduction to the scope of the IMDG code, the student learns to classify dangerous substances and to deduce the risks of substances from their description (in the IMDG code itself and in the safety data sheets). The student then applies the rules of the Code concerning the stowage and segregation of dangerous goods on board a ship. By designing a scientific poster around one of the most frequently encountered (groups of) hazardous substances and explaining this poster in a joint poster session, the student learns to recognize these products and to estimate the dangers associated with them. this. The student then trains to use the IMDG code and various safety data sheets to research the properties of dangerous substances and determine the required separation of cargoes on the basis of this.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1** / **Following Module 2.2 oral exam with written preparation** **Second session oral exam with written preparation**
Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	- International Maritime Organization. (latest ed.). International Maritime Dangerous Goods Code. London, UK: IMO. - Lewis, R.J. (2001). Hawley's Condensed Chemical Dictionary (14th ed.). New York, NY: John Wiley & Sons - Meyer, E. (2005). Chemistry of hazardous materials (4th ed.). Upper Saddle River, NJ: Pearson Prentice Hall. - Samson Chemical Publishers (latest ed.). *Chemical Safety Sheets.* Dordrecht, The Netherlands: Kluwer Academic Publishers. - Samson Chemical Publishers. (1991). Chemical Safety Sheets: Working safely with hazardous chemicals. Dordrecht, Nederland: Kluwer Academic Publishers.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 2) (4 UC)**
Course element	**Basic tanker training (oil, gas, chem) & IGF - theory &** **Basic tanker training (oil, gas, chem) & IGF - exercises**
Lecturer(s)	**Kris DE BAERE** **Guido DELVAUX, Anne-Pascale MORNARD**
Lecturer in charge	Kris DE BAERE
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture Practical exercises			
Other teaching methods				
Instruction language	English			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	24/12			
Semester + module(s)	**Semester 1, Module 1.1 12/6**	**Semester 1, Module 1.2 12/6**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	This course deals with the theoretics behind the transport, storage and manipulation of oil cargoes and is conform with STCW2010 Specifications of minimum standards of competence in: - basic training for oil and chemical tanker cargo operations (A-V/1-1-1) - basic training for liquefied gas tanker cargo operations (A-V/1-2-1) - advanced training for oil cargo operations (A-V/1-1-2) - model courses 1.01. & 1.02 - IGF Simulator exercises for tankers			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1)			

Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 oral exam with written preparation permanent evaluation**	**Following Module 2.1**	**Following Module 2.2**
	Second session oral exam with written preparation			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				
Additional information	- Bruhn, C. (latest ed.). *Dr. Verwey's Tank Cleaning Guide.* Dassendorf, Germany: ChemServe. - International Chamber of Shipping. (latest ed.). *Clean seas guide for oil tankers.* London, UK: ISC. - International Chamber of Shipping. (latest ed.). *International safety guide for oil tankers and terminals (ISGOTT)*. London, UK: ICS. - International Chamber of Shipping. (latest ed.). *Ship to ship transfer guide.* London, UK: ISC. - International Maritime Organization. (1973-1978). *International Convention for the Prevention of Pollution from Ships (MARPOL) 1973-1978, as amended*. London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - Intertanko. (latest ed.). *Effective crude oil washing.* Oslo, Norway: Intertanko.			

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**GENERAL MECHANICS (4 UC)**
Course element	**General mechanics**
Lecturer(s)	**Deirdre LUYCKX, Carine REYNAERTS**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Mathematics			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	48/-			
Semester + module(s)	**Semester 1, Module 1.1 24/-**	**Semester 1, Module 1.2 24/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Fundamentals of Newtonian mechanics: kinematics and dynamics of particles, systems of particles and rigid bodies; force and torque; work and energy (conservative and non-conservative forces: terrestrial gravity, mass-spring systems, dry friction); impulse, linear momentum and collisions; free, forced and damped oscillations; angular momentum, moment of inertia and rotation; static equilibrium.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2)			
Examination	**Following Module 1.1**	**Following Module 1.2 written exam**	**Following Module 2.1**	**Following Module 2.2**
	Second session written exam			
Required study material	Lecturer's course text available. Scientific calculator.			
Recommended preliminary competences				

Additional information	- Giancoli, D. C. (2008). *Physique générale, Volume 1, Mécanique et thermodynamique*. Bruxelles, Belgique: De Boeck. - Giancoli, D. C., Poelman, D., & Kerkhof, M. (2015). *Natuurkunde Deel 1, Mechanica en thermodynamica*. Amsterdam, Nederland: Pearson. - Hibbeler, R. C. (2016). *Engineering mechanics, Dynamics*. Hoboken, US: Pearson. - Hibbeler, R. C. (2016). *Engineering mechanics, Statics* (Fourteenth edition.). Hoboken, US: Pearson. - Hibbeler, R. C., Fan, S. C., Lefeber, D., van Overmeire, M., & Sol, H. (2011). *Dynamica*. Amsterdam, Nederland: Pearson Education Benelux. - Hibbeler, R. C., Fan, S. C., Lefeber, D., van Overmeire, M., Pyl, L., Mars, J., Kerkhof, M., e.a. (2015). *Statica*. Amsterdam, Nederland: Pearson Education Benelux.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**HYDROMECHANICS AND RESEARCH METHODOLOGY (3 UC)**
Course element	**Hydromechanics**
Lecturer(s)	**Raf MAES**
Lecturer in charge	Raf MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1** **24/-**	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Basics of hydrostatics: hydrostatic pressure, resultant force due to hydrostatic pressure on both plane and curved surfaces, centre of pressure, principle of Archimedes. Basics of hydrodynamics: Bernoulli's equation for both ideal and real liquids, volume flow rate continuity equation, Venturi tube, Pitot tube, total head of a pump, cavitation, loss head for both laminar and turbulent flow in circular pipes.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)			
Examination	Following Module 1.1 -	**Following Module 1.2** **written exam**	Following Module 2.1 -	Following Module 2.2 -
	Second session **written exam**			
Required study material	Lecturer's course text available. Scientific calculator.			

Recommended preliminary competences	General mechanics
Additional information	- Wiggert, D.C. & Potter M.C. (2008). *Fluid Mechanics*. Schaum's Outline Series. New York, NY: McGraw-Hill Education.

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**HYDROMECHANICS AND RESEARCH METHODOLOGY (3 UC)**
Course element	**Methodology of scientific research**
Lecturer(s)	**Han JACOBS, Deirdre LUYCKX, Raf MAES**
Lecturer in charge	Raf MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	6/-			
Semester + module(s)	**Semester 1, Module 1.1 6/-**	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The course consists of three parts. Part 1: processing of measurements (Raf Maes) Part 2: collecting information (Han Jacobs, Raf Maes) Part 3: structure of a dissertation and bibliography (Deirdre Luyckx)			
Learning outcomes	- Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)			
Examination	**Following Module 1.1 practical test**	Following Module 1.2 -	Following Module 2.1 -	Following Module 2.2 -
	Second session practical test			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				

Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**MARITIME ENGLISH (PART 2) (4 UC)**
Course element	**Maritime English (part 2)**
Lecturer(s)	**Pieter DECANCQ**
Lecturer in charge	Pieter DECANCQ
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods	Portfolio			
Instruction language	English			
Required preliminary credit(s)	Maritime English (Part 1)			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	24/12			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2 -/12**	**Semester 2, Module 2.1 12/-**	**Semester 2, Module 2.2 12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content				
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)			

Examination	**Following Module 1.1**	**Following Module 1.2 oral exam**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 oral exam**
	Second session written exam			
Required study material	Lecturer's course text available. - Buckowska, W. (2014). *MarEngine English Underway.* Dokmar, the Netherlands. ISBN: 9789071500268. - International Maritime Organization. (2002). *Standard Marine Communication Phrases*. London, UK: IMO. ISBN: 9789280142112. - Murphy, R. (2004). *English Grammar in Use.* (4th ed.). Cambridge, UK: Cambridge University Press. ISBN: 97811075339334. - Murphy, R. (2004). *Essential Grammar in Use* (3rd ed.). Cambridge, UK: Cambridge University Press. ISBN 9781107480551. - Nisbet, A., Witcher Kutz, A. & Logie, C. (1997). *Marlins English for Seafarers, Study Pack 1*. Edinburgh, UK: Marlins. ISBN: 0 9531748 08. - Nisbet, A., Witcher Kutz, A. & Logie, C. (1998). *Marlins English for Seafarers, Study Pack 2*. Edinburgh, UK: Marlins. ISBN 0953174816. - Petkova, V. & Toncheva, S. (2016). *Correspondence and Communications in Shipping*. Varna, Bulgaria: Steno Publishing House. ISBN: 978-954-449-853-5. - Van Kluijven, P.C. (2007). *The International Maritime Language Programme*. Sint Pancras, the Netherlands: Alk & Heijnen Publishers ISBN: 9789059610064.			
Recommended preliminary competences				
Additional information	- International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended*. London, UK: IMO. - International Maritime Organization. (2002). Standard Marine Communication Phrases. London, UK: IMO.			

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**THERMODYNAMICS (PART 2) (4 UC)**
Course element	**Thermodynamics (part 2)**
Lecturer(s)	**Tim COOLS**
Lecturer in charge	Tim COOLS
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Thermodynamics (Part 1)			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	30/-			
Semester + module(s)	**Semester 1, Module 1.1 18/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			

Course content	The student demonstrates an understanding of: - heat exchangers with their different flows; - the formula for the temperature differences and for the heat transfer; - the real heat exchanger; - the heat exchanger with phase change; - the different types, their construction and applications; - important concepts; - revision of concepts of the first part; - l'entropy, introduction and physical interpretation, the different diagrams; - the important thermodynamic diagrams; - the calculation of enthalpy and entropy; - entropy S; - the formulas for S; - the reversible and irreversible processes; - the Ts-diagram for steam production; - the entropy of saturated and non-saturated steam: formula and representation in a Ts-diagram; - the first law for open systems; - the general formula; - the application of this formula for different systems; - special open systems; - the steam choke valve and turbine power regulation; - the study of nozzles as applied with turbines; - the steam ejector as applied on the steam condenser; - the second law for cycles; - the pV-diagram of the steam production; - conventions and efficiency calculations; - the second law; - the definition of the second law, positive and negative cycles. The Carnot cycle; - the irreversible cycles. The measure for irreversibility. The representation in the Ts-diagram, the formula for friction. The isentropic efficiency. The production of the entropy as a function of the temperature; - the cycle of Rankine; - the cycle of Brayton; - the Ts-diagram for the steam production; - the combined heat-power cycle. The representation of Q,W en the efficiency; - the Carnot cycle for steam production; - the Rankine cycle and efficiency improvements; - the total energy balance of the steam boiler. The student is able to use his acquired knowledge in practical calculations.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15)

Examination	**Following Module 1.1**	**Following Module 1.2 written exam**	**Following Module 2.1**	**Following Module 2.2**
	Second session written exam			
Required study material	Lecturer's course text available. Scientific calculator.			
Recommended preliminary competences				
Additional information	- Andre Houberechts. (1996). *La thermodynamique technique*. Bruxelles, Belgique: Vander. - Cengel, Y. (2009). *Introduction to thermodynamics and heat transfer.* New York, US*:* McGraw-Hill. - Kimmenaede. (2010). *Warmteleer voor technici*. Groningen, Nederland: Noordhoff Uitgevers. - Moran, M., Shapiro, H., Boettner, D., Bailey, M. (2012). *Principles of Engineering Thermodynamics – SI Version (7th ed.).* Hoboken, N.J., US: Wiley.			

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S AUXILIARY ENGINES (PART 1) (6 UC)**
Course element	**Ship's auxiliary engines (part 1)**
Lecturer(s)	**Vincent LEYSEN**
Lecturer in charge	Tim COOLS
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	6			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2 12/-**	**Semester 2, Module 2.1 6/-**	**Semester 2, Module 2.2 6/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Repetition of the pipe losses in a pipe network. the various pumps and their pump characteristics are discussed on the basis of the pipe characteristics. The in dept study of the piston compressor and the rotating compressor.Multiple stage compressor and calculations on a two stage compression. How axial machines work is studied by means of the geometry and it's applications. The theoretical study of different turbines with practical conclusions. The study of gas turbines and the cooling units. Drying by compressed air.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)			

Examination	**Following Module 1.1**	**Following Module 1.2 written exam**	**Following Module 2.1**	**Following Module 2.2 written exam**
	Second session written exam			
Required study material	Lecturer's course text available.			
Recommended preliminary competences	Mathematics			
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**STEAM INSTALLATIONS (PART 2) (3 UC)**
Course element	**Steam installations - theory**
Lecturer(s)	**Stefaan BUEKEN**
Lecturer in charge	Stefaan BUEKEN
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods	Demonstration			
Instruction language	Dutch/French			
Required preliminary credit(s)	Steam installations (part 1)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The study of the process regulation of the steam boiler and support-circuits. The operation of the level-control, the pressure-control and TDS-control. The water treatment before and in operation. Operation and maintenance on the condensor. construction, operation and maintenance of the different burner-types Specificities in the distribution of steam.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5)			

Examination	Following Module 1.1 -	**Following Module 1.2** **written exam**	Following Module 2.1 -	Following Module 2.2 -
	Second session **written exam**			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**STEAM INSTALLATIONS (PART 2) (3 UC)**
Course element	**Steam installations - excercises**
Lecturer(s)	**Stefaan BUEKEN**
Lecturer in charge	Stefaan BUEKEN
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Steam installations (part 1)			
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	-/12			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2** **-/12**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Apply to the simulator of our theoretical knowledge about control circuits on the steam boiler. We start the steam boiler step by step and look at the problems with the automatic controls. We look at the fuel circuits, the burners, the water circuit, the steam condenser and the condensate recovery. We start various turbines and other consumers and always try to maintain a stable working system.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5)			
Examination	**Following Module 1.1**	**Following Module 1.2 permanent evaluation with integrated practical test**	**Following Module 2.1**	**Following Module 2.2**
	Second session practical test			
Required study material				

Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**STRENGTH OF MATERIALS (4 UC)**
Course element	**Strength of materials**
Lecturer(s)	**Stefaan BUEKEN**
Lecturer in charge	Stefaan BUEKEN
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Mathematics			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	30/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **18/-**	**Semester 2, Module 2.2** **12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	calculation or internal forces and moments; normal stress and shear stress. properties of materials (stress-strain diagram); infuence cause of fatigue and cold flow (creep) calculation of maximum pulling or compressing forces and deformation caused by it. Calculate stress caused by thermal forces and hyperstatic problems. calculate critical forces for buckling. strain in thin walled pressure vessels shear stress in bolted constructions and splines deflection and bending stiffness of beams strain in shafts caused by torsion, deformation caused by torsion and concentration of stress in axles with variable diameter.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1 written exam** / **Following Module 2.2 written exam** **Second session written exam**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**SHIP'S AUTOMATION (PART 1) (4 UC)**
Course element	**Ship's automation (part 1) - theory & Ship automation (part 1) - exercises**
Lecturer(s)	**Raf MAES**
Lecturer in charge	Raf MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	24/8			
Semester + module(s)	**Semester 1, Module 1.1 6/8**	**Semester 1, Module 1.2 6/-**	**Semester 2, Module 2.1 6/-**	**Semester 2, Module 2.2 6/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student learns basic skills and notions in control engineering. Basic exercises on controltheory, sensors and actuators. In this part we will an exercise on systmes and we will have a look at the different actions of a controller and we will do an exercise on measuring and processing the data of the measurements			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Administer computer networks on board. (BA-SW-9) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)
Examination	**Following Module 1.1** **permanent evaluation with integrated practical test** Following Module 1.2 - Following Module 2.1 - **Following Module 2.2** **oral exam with written preparation** **Second session** **oral exam with written preparation** **practical test**
Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	- Distefano J. (1987). *Feedback and control systems.* Columbus, US: McGraw-Hill Company. - Verwer, A., Golten, J. (1991). *Control system design and simulation.* Columbus, US: McGraw-Hill Company.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTRONICS (PART 1) (6 UC)**
Course element	**Ship's electronics / digital techniques (part 1) - theory**
Lecturer(s)	**Pascal BOUQUET, Tim JANSSENS**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Digital and analogue quantities, binary digits, logic levels, logic gates, binary numbers, bytes and words, binary arithmetic. Inverters, AND gate, OR gate, NAND, NOR, Exclusive-OR, integrated circuits. Truth tables, Boolean algebra, the Karnaugh map, DeMorgan's theorem, the universal property of NAND gates. Adders, comparators, decoders and encoders, multiplexers and demultiplexers, parity checkers. Latches and flip-flops, master-slave and edge-triggered devices, D-types, S-R types and J-K types. Counters, shift registers, the finite state machine (FSM). Random-access memories (RAMs), read-only memories (ROMs), programmable memory (PROMs, EPROMs, Flash). Magnetic and optical storage. Digital-to-analog converters (DACs), analog-to-digital converters (ADCs) and data buses. Typical architectures, central processing unit (CPU), programme and data memories, registers, buses, input/output (I/O) ports, the control unit.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Administer computer networks on board. (BA-SW-9) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)
Examination	**Following Module 1.1** / **Following Module 1.2 oral exam with written preparation** / **Following Module 2.1** / **Following Module 2.2** **Second session oral exam with written preparation**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**SHIP'S ELECTRONICS (PART 1) (6 UC)**
Course element	**Ship's electronics / analogue techniques (part 1) - theory**
Lecturer(s)	**Willem MAES**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **12/-**	**Semester 2, Module 2.2** **12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			

Course content	Basic principles of industrial analog electronics. basic knowledge about filters, diodes, thyristors, transistors, mosfets and operational amplifiers. - The diode PN junction, dissipation power, characteristics, static and dynamic resistance, load line and operating point, specifications and embodiments. - The LED Symbol, U / I characteristic, calculating series resistance, specifications. - Diode as a rectifier Circuit and operation, calculation of rectified voltage, voltage across the diode. Switching with central tap and bridge connection. Calculation of the rectified voltage. Voltage across the diode. - Capacitor as a smoothing agent Operation, calculation of the ripple voltage, variation of tensions. - The Zener diode Symbol and operation, power dissipation, characteristics, load line and operating point, specifications, voltage stabilizations. - The thyristor Symbol and operation, power dissipation, characteristics, load line and duty point, specifications - Integrated voltage regulators Fixed voltage regulator, circuit, properties, power dissipation, specifications. Adjustable voltage regulator (LM317), circuit, properties, additional components for optimization, calculating output voltage, specifications. Specifications of integrated voltage regulators, voltage, maximum current. - The Bipolar transistor Construction, transistor effect, basic circuits of transistors, GES circuit, specifications. - The bipolar transistor as a switch Operating states, maximum values, switching of inductive loads. - The mosfet Symbol and operation, power dissipation, characteristics, load line and duty point, specifications - Operational amplifiers. Symbol and operation, properties and basic circuits.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)

Examination	Following Module 1.1 -	Following Module 1.2 -	Following Module 2.1 -	**Following Module 2.2 oral exam with written preparation**
	Second session oral exam with written preparation			
Required study material	Lecturer's course text available. Scientific calculator. - Hambley, A.R. (latest ed.). *Electrical Engineering, Principles and Application.* New York, USA: Pearson.			
Recommended preliminary competences	Mathematics Proficiency in General English is recommended			
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTRONICS (PART 1) (6 UC)**
Course element	**Ship's electronics (part 1) - practice**
Lecturer(s)	**Pascal BOUQUET, Tim JANSSENS**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/32			
Semester + module(s)	**Semester 1, Module 1.1 -/8**	**Semester 1, Module 1.2 -/8**	**Semester 2, Module 2.1 -/8**	**Semester 2, Module 2.2 -/8**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Lab tests after the theory seen during the theory lessons:			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Administer computer networks on board. (BA-SW-9) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)			
Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 permanent evaluation with integrated practical test**
	Second session practical test			
Required study material	Lecturer's course text available. Scientific calculator.			

Recommended preliminary competences	Mathematics Proficiency in General English is recommended
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTROTECHNICS (PART 1) (8 UC)**
Course element	**Ship's electrotechnics (part 1) - theory**
Lecturer(s)	**Rik Floren, Marc STERKENS**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	48/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	**Semester 2, Module 2.1 12/-**	**Semester 2, Module 2.2 12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Study of direct current engines, transformers, asynchronous motors, synchronous engines and generators.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)			
Examination	**Following Module 1.1 oral exam with written preparation**	**Following Module 1.2 oral exam with written preparation**	**Following Module 2.1 oral exam with written preparation**	**Following Module 2.2 oral exam with written preparation**
	Second session oral exam with written preparation			
Required study material	Lecturer's course text available.			
Recommended preliminary competences	Mathematics Proficiency in General English is recommended			

Additional information	- Wildi, T. (2002). *Electrical Machines, Drives, and Power Systems* (5th ed. or newer). Upper Saddle River, New Jersey. US. Pearson Education Inc.

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**SHIP'S ELECTROTECHNICS (PART 1) (8 UC)**
Course element	**Ship's electrotechnics (part 1) - practice**
Lecturer(s)	**Rik FLOREN, Marc STERKENS**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods	Group work Demonstration			
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/32			
Semester + module(s)	**Semester 1, Module 1.1 -/8**	**Semester 1, Module 1.2 -/8**	**Semester 2, Module 2.1 -/8**	**Semester 2, Module 2.2 -/8**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The purpose of this workshop is to learn about electrical measurements and practical tests on electrical machinery. Special attention shall be made to safety. Both the direct and alternating voltage machines are dealt with			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)			

Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 permanent evaluation with integrated practical test**
	Second session practical test			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTROTECHNICS (PART 1) (8 UC)**
Course element	**Pneumatics - exercises**
Lecturer(s)	**Tim JANSSENS**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	-/8			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2** **-/8**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Construction of pneumatic systems. Developing pneumatic solutions for a technical problem: - read and interpret pneumatic diagrams. - build pneumatic diagrams based on a problem. - implement a practical simulation of a pneumatic schedule.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)			
Examination	**Following Module 1.1**	**Following Module 1.2 permanent evaluation with integrated practical test**	**Following Module 2.1**	**Following Module 2.2**
	Second session practical test			
Required study material				
Recommended preliminary competences				

Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTROTECHNICS (PART 1) (8 UC)**
Course element	**Sequential systems and PLC-systems**
Lecturer(s)	**Rik FLOREN**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1) General electricity Mathematics			
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	-/16			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **-/8**	**Semester 2, Module 2.2** **-/8**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	PLC programmation. Familiarization of students with sequential systems and PLC. Development of programs based on practical exercises.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 permanent evaluation with integrated practical test**
	Second session practical test			
Required study material				
Recommended preliminary competences				

Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S DIESEL ENGINES (PART 2) (4 UC)**
Course element	**Ship's diesel engines (part 2)**
Lecturer(s)	**Tim JANSSENS**
Lecturer in charge	Tim JANSSENS
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's diesel engines (Part 1)			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **12/-**	**Semester 2, Module 2.2** **12/-**
Learning objectives	At the end of the course, the student is expected to be able to: -Recognize the different organs of power distribution in a diesel engine; -Be able to formulate the different parts of a diesel injection system and to explain its purpose and operation; -Be able to formulate the different parts of a lubrication system and to explain its purpose and operation; -The influence of the efficiency of a diesel engine by being able to interpret internal and external factors (air intake, injection timing, load, etc.); -Name and illustrate the various functions of a speed controller; -Be able to describe the operation and purpose of a turbocharger			

Course content	With this course, the student builds on the diesel engines part 1 course. The following themes and topics are covered: -Description and working principles of distribution and transmission of forces within a diesel engine, coupled to a slow speed engine, medium speed engine and fast speed engine. -Description, purpose, working principles and use of forced air supply on a diesel engine in relation to efficiency. -Description and working principles of various fuel injection techniques for a slow speed engine, medium speed engine and fast speed engine. -Charted the combustion process of a diesel engine as a relationship between pressure and volume using PV daggram and Ricardo diagram. -Description, operating principles and use of a speed controller on a diesel engine. -Description, purpose, working principles and use of lubrication, lubrication circuit and lubricants based on examples and diagrams on board a ship.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15)
Examination	**Following Module 1.1** | **Following Module 1.2** | **Following Module 2.1** | **Following Module 2.2 written exam** **Second session written exam**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	
Additional information	- Briand, J. (2008). *Diesels marins*. Rennes, France: Infomer. - Kuiken, K. (2008). *Diesel Engines I & II.* Onnen, The Netherlands: Target Global Energy Training. - Van Maanen, P. (1992). *Scheepsdieselmotoren 1.* Harfsen, Nederland: Nautech. - Van Maanen, P. (1994). *Scheepsdieselmotoren 2.* Harfsen, Nederland: Nautech.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1) (3 UC)**
Course element	**Multidisciplinary simulator exercises (part1)**
Lecturer(s)	**Filip VAN GUTTE**
Lecturer in charge	Willem MAES
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Maritime English (Part 1)			
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	-/48			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **-/24**	**Semester 2, Module 2.2** **-/24**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student learns the good functioning of a engine room			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 permanent evaluation**
	Second session practical test			
Required study material				

Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**WORKSHOP PRACTICE (PART 2) (3 UC)**
Course element	**Workshop practice**
Lecturer(s)	**Stefaan BUEKEN, Tim JANSSENS, Marc STERKENS, Filip VAN GUTTE**
Lecturer in charge	Tim JANSSENS
Educational programme	**Second year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Technical drawing, workshop practice (part 1)			
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	-/48			
Semester + module(s)	**Semester 1, Module 1.1 -/12**	**Semester 1, Module 1.2 -/12**	**Semester 2, Module 2.1 -/12**	**Semester 2, Module 2.2 -/12**
Learning objectives	At the end of the course, the student is expected to be able to: - to dismantle technical equipment (motors, pumps and related equipment) on board a ship in a safe and technically sound manner, using the procedures described in the manual; - making workpieces according to plan using various industrial techniques such as turning, drilling, sawing, thread cutting and welding; - carry out different welding processes (BMBE, mag and autogenous) and visually assess the result.			

Course content	In the workshop the student learns: - to make safe and correct use of the tools, measuring instruments and machines (grinding wheel, drill, sanding belt, ...) that are regularly used by the marine engineer on board; - safely and correctly apply the techniques used by the marine engineer (butt and fillet welds in horizontal and vertical planes, ascending and descending, cylindrical turning and end faces, drilling); - to dismantle the technical equipment on board a ship in a safe and technically responsible manner (piston pumps, diesel engines, diesel pumps, valves) and also to professionally assess the condition of the parts of these machines/devices and to take the necessary measures to ensure that they are optimal function after assembly; - to manufacture conical pieces on the lathe and to perform both internal and external turning with high accuracy (fits); - dismantle centrifugal, jet and volumetric pumps safely and technically responsibly, professionally assess them and take the necessary measures to ensure that they function optimally after assembly; - to make a construction of seals and gaskets; TIG welding and MAG and Autogenous welding techniques to be applied in a horizontal plane.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Safely handle repair tools, hand over the watch and fully supervise fuel transfers. (BA-SW-6) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)
Examination	**Following Module 1.1 permanent evaluation** / **Following Module 1.2 permanent evaluation** / **Following Module 2.1 permanent evaluation** / **Following Module 2.2 permanent evaluation with integrated practical test** **Second session practical test**

Required study material	Lecturer's course text available. Safety clothing.
Recommended preliminary competences	Ship's diesel engines (Part 1)
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 3) (7 UC)**
Course element	**Ship safety**
Lecturer(s)	**Anne-Pascale MORNARD**
Lecturer in charge	Helen VERSTRAELEN
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	12/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2** **12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	This course deals with several specific safety subjects on board of different types of vessels. Often, the problems encountered are linked to the cargo. We will discuss among others the fires on bord gastankers, toxic cargoes on board chemical carriers, enclosed spaces entry, detection and measure equipment, personnal protective clothes including ear protection, the ship-shore safety checklist or bunkering checklist, the permit-to-work sytsem...			
Learning outcomes				
Examination	**Following Module 1.1**	**Following Module 1.2** **written exam**	**Following Module 2.1**	**Following Module 2.2**
	Second session **written exam**			
Required study material	Lecturer's course text available.			
Recommended preliminary competences	Proficiency in General English is recommended			

Additional information	- International Association on Classification Societies. (latest ed.). *Guideance for entry into enclosed spaces*. London, UK: IACS. - International Chamber of Shipping / OCIMF. (2006). *International Safety Guide for Oil Tankers and Terminals.* Edingburgh, UK: Witherbys Publishing. - International Chamber of Shipping. (latest ed.). *Tanker Safety Guide Liquified Gas. London, UK:* Marisec Publications. - International Chamber of Shipping. (latest ed.). *Tanker Safety Guide Petroleum. London, UK:* Marisec Publications. - International Chamber of Shipping. (latest ed.). *Tanker Safety Guide Chemicals. London, UK:* Marisec Publications. - International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - International Maritime Organization. (2000). *International Code for Fire and Safety Systems (FSS Code)*. London, UK: IMO. - International Maritime Organization. (latest ed.). *International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code).* London, UK: IMO. - International Maritime Organization. (latest ed.). *Code on noise levels on board ships*. London, UK: IMO. - International Maritime Organization. (latest ed.). *IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).* London, UK: IMO.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 3) (7 UC)**
Course element	**ISPS & ISM**
Lecturer(s)	**Marieke UTEN, Guido DELVAUX**
Lecturer in charge	Helen VERSTRAELEN
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	30/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	**Semester 2, Module 2.2 30/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	ISPS and ISM code are disussed in detail. The concept of risk and risk analysis techniques will be discusssed.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1**	**Following Module 2.2 written exam**
	Second session written exam			
Required study material	Lecturer's course text available. - International Maritime Organization. (latest ed.). *International Safety Management Code (ISM).* London, UK: IMO. - International Maritime Organization. (latest ed.). *International Ship and Port Facility Security Code (ISPS).* London, UK: IMO.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**SHIP TECHNIQUE (PART 3) (7 UC)**
Course element	**Stability**
Lecturer(s)	**Ynse JANSSENS**
Lecturer in charge	Helen VERSTRAELEN
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	12/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	**Semester 1, Module 1.2** **12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Introduction to the study on the stability of ships. The course covers, among other things, the following items: displacement, deadweight, draughts, buoyancy, type A and type B vessels, FWA, TPC, initial stability, statical stability, centre of gravity, curve of statical stability, angle of loll, movement of the centre of gravity, list and the effect of slack tanks.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)			
Examination	**Following Module 1.1**	**Following Module 1.2** **written exam**	**Following Module 2.1**	**Following Module 2.2**
	Second session **written exam**			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				

Additional information	- Barrass, B., Derrett, D.R. (latest ed.) *Ship Stability for Masters and Mates.* London, UK: Butterworth-Heinemann. - International Maritime Organization. (1966). *International Load Lines Convention (ILL) 1966, as amended.* London, UK: IMO. - International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - International Maritime Organization. (latest ed.). *Recommendation on Intact Stability for Passenger and Cargo Ships.* London, UK: IMO. - Rhodes, M. (2009). *Ship Stability OOW*. Edingburgh, UK: Witherby Seamanship International. - Rhodes, M. (2020). Ship Stability Strength and Loading Principles. Edingburgh, UK: Witherby Seamanship International. - van Dokkum, K. (latest ed.). *Ship Stability.* Enkhuizen, The Netherlands: Dokmar.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 3) (7 UC)**
Course element	**Maritime ecology and environmental regulations**
Lecturer(s)	**Helen VERSTRAELEN**
Lecturer in charge	Helen VERSTRAELEN
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	12/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	**Semester 2, Module 2.2 12/-**
Learning objectives	At the end of the course, the student is expected to be able to: - define the sources of maritime pollution and assess their environmental impact; - apply theoretical knowledge of the international environmental legislation in force for shipping; - make connections between sources of pollution and applicable environmental regulations; - apply international environmental regulations in specific situations; - fill in logbooks with regard to environmental regulations and understand the importance of these logbooks; - understand certificates and other documents related to environmental regulations and their importance; - advise on how to reduce the environmental impact of shipping in the future; - act preventively with the aim of minimising the environmental impact of shipping; - formulate proposals for the prevention and reduction of environmental damage caused by shipping.			

Course content	Shipping has a major impact on the maritime environment. During this course, the student studies this impact on the basis of the MARPOL convention and the other international conventions on maritime pollution. More specifically, the student acquires knowledge and insights on the following topics: pollution by tankers and bulk carriers, air pollution, pollution by garbage and sewage, the impact of ballast water, biofouling, antifouling, noise pollution and pollution during ship recycling. However, the course goes beyond the legislation and the resulting obligations of seafarers. The impact of men to te environment is one of the biggest challences of the 21st century. The student learns from background information to make connections between causes of pollution and effects on the maritime environment. In addition, he/she helps with the search for possible future options to prevent, reduce and eliminate this impact.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** | **Following Module 1.2** | **Following Module 2.1** | **Following Module 2.2 written exam** **Second session written exam**
Required study material	Lecturer's course text available.
Recommended preliminary competences	Basic tanker training (oil, gas, chem) & IGF - theory Basic tanker training (oil, gas, chem) & IGF - exercises Ship's administration and maritime law
Additional information	- International Maritime Organization. (1973-1978). *International Convention for the Prevention of Pollution from Ships 1973-1978, as amended*. London, UK: IMO. - International Maritime Organization. (2001). *International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001, as amended*. London, UK: IMO. - International Maritime Organization. (2004). *International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004, as amended*. London, UK: IMO. - International Maritime Organization. (2009). *Hong Kong International Convention for the Safe and Environmental Sound Recycling of Ships 2009, as amended*. London, UK: IMO.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP TECHNIQUE (PART 3) (7 UC)**
Course element	**Ship's administration and maritime law**
Lecturer(s)	**Marieke UTEN**
Lecturer in charge	Helen VERSTRAELEN
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	12/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **-/12**	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The objective of the course is to introduce the students into the knotty ship's administration and to give them an overview of all relevant national and international compulsory documents and of the related organizations, conventions, laws and regulations.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1** **written exam**	**Following Module 2.2**
	Second session **written exam**			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				

Additional information	- International Maritime Organization. (1966). *International Load Lines Convention (ILL) 1966, as amended.* London, UK: IMO. - International Maritime Organization. (1969). *International Tonnage Convention 1969, as amended.* London, UK: IMO. - International Maritime Organization. (1973-1978). *International Convention for the Prevention of Pollution from Ships. (MARPOL) 1973-1978, as amended*. London, UK: IMO. - International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - International Maritime Organization. (latest ed.). *International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code).* London, UK: IMO. - International Maritime Organization. (latest ed.). *International Safety Management Code (ISM).* London, UK: IMO. - International Maritime Organization. (latest ed.). *IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).* London, UK: IMO.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**ECONOMIC EVALUATION OF MAINTENANCE (3 UC)**
Course element	**Economic evaluation of maintenance**
Lecturer(s)	**Koen VASTMANS**
Lecturer in charge	X
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	12/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	**Semester 2, Module 2.2 12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Introduction to general and maritime economics. Essentials of financial calculation. Introduction to investment analysis. Introduction to cost calculation and budgeting. Introduction to stock management. Types of maintenance. Planning of maintenance.			
Learning outcomes	- Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1**	**Following Module 2.2 oral exam with written preparation**
	Second session oral exam with written preparation			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**COMMUNICATION IN A MARITIME INTERCULTURAL CONTEXT (3 UC)**
Course element	**Communication in a maritime and intercultural context**
Lecturer(s)	**Christophe COLLARD, Ludwina VAN SON**
Lecturer in charge	Ludwina VAN SON
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods	Portfolio Group work			
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The objective of this course is to enable marine engineers (engineer officers) to obtain a good understanding of the communication process and their communication skills and to prepare them in an adequate and professional way for specific communicative tasks (briefing, presentation, job interview), both in general and with an eye on their specific professional situation. Given the multicultural composition of the crew, its impact on communication and interaction on board will be discussed. Team work, leadership and conflict management are the other topics to be addressed. Furthermore, attention will be given to academic writing.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12)			
Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation**	**Following Module 2.1**	**Following Module 2.2**
	Second session oral exam			

Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	**Bachelor in Marine Engineering**
Course	**MARITIME ENGLISH (PART 3) (3 UC)**
Course element	**Maritime English (part 3)**
Lecturer(s)	**Pieter DECANCQ**
Lecturer in charge	Pieter DECANCQ
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods	Portfolio			
Instruction language	English			
Required preliminary credit(s)	Maritime English (Part 2)			
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content				
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)			

Examination	**Following Module 1.1** **permanent evaluation**	**Following Module 1.2** **oral exam**	**Following Module 2.1** **permanent evaluation**	**Following Module 2.2**
	Second session **oral exam with written preparation**			
Required study material	Lecturer's course text available. - Buckowska, W. (2014). *MarEngine English Underway.* Dokmar, the Netherlands. ISBN: 9789071500268. - International Maritime Organization. (2002). *Standard Marine Communication Phrases*. London, UK: IMO. ISBN: 9789280142112. - Murphy, R. (2004). *English Grammar in Use.* (4th ed.). Cambridge, UK: Cambridge University Press. ISBN: 97811075339334. - Murphy, R. (2004). *Essential Grammar in Use* (3rd ed.). Cambridge, UK: Cambridge University Press. ISBN 9781107480551. - Nisbet, A., Witcher Kutz, A. & Logie, C. (1997). *Marlins English for Seafarers, Study Pack 1*. Edinburgh, UK: Marlins. ISBN: 0 9531748 08. - Nisbet, A., Witcher Kutz, A. & Logie, C. (1998). *Marlins English for Seafarers, Study Pack 2*. Edinburgh, UK: Marlins. ISBN 0953174816. - Petkova, V. & Toncheva, S. (2016). *Correspondence and Communications in Shipping*. Varna, Bulgaria: Steno Publishing House. ISBN: 978-954-449-853-5. - Van Kluijven, P.C. (2007). *The International Maritime Language Programme*. Sint Pancras, the Netherlands: Alk & Heijnen Publishers ISBN: 9789059610064.			
Recommended preliminary competences				
Additional information	- International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended*. London, UK: IMO. - International Maritime Organization. (2002). Standard Marine Communication Phrases. London, UK: IMO.			

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S AUTOMATION (PART 2) + SIMULATOR TRAINING (5 UC)**
Course element	**Ship's automation (part 2) - theory &** **Ship's automation (part 2) - exercises**
Lecturer(s)	**Raf MAES**
Lecturer in charge	Raf MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2) Ship's automation (Part 1)			
Units of credit (UC)	4			
Hours of formal lecture/practical exercise	48/32			
Semester + module(s)	**Semester 1, Module 1.1 12/8**	**Semester 1, Module 1.2 12/8**	**Semester 2, Module 2.1 12/8**	**Semester 2, Module 2.2 12/8**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student will improve his knowledge on more advanced subjects in control engineering. We will talk about the stability of digital systems and controlling non linear systems by means of Fuzzy Logic.Hereafter we will talk about special controlloops and hardware more specific measuring techniques and safety. The students know how to deal with practical problems. We will look at different strategies of controlloops and how to measure something and process the measuring data. We will also broaden the view on certain things and like for example financing controlloops. Security will also be taken into a broader view.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15)
Examination	**Following Module 1.1** **permanent evaluation** **Following Module 1.2** **oral exam with written preparation** **permanent evaluation** **Following Module 2.1** **permanent evaluation** **Following Module 2.2** **oral exam with written preparation** **permanent evaluation with integrated practical test** **Second session** **oral exam with written preparation** **practical test**
Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	- Distefano J. (1987). *Feedback and control systems.* Columbus. US: McGraw-Hill Company. - Distefano J. (1987). *Feedback and control systems.* Columbus, US: McGraw-Hill Company. - Verwer, A., Golten, J. (1991). *Control system design and simulation.* Columbus, US: McGraw-Hill Company. - Verwer, A., Golten, J. (1991). *Control system design and simulation.* Columbus, US: McGraw-Hill Company.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S AUTOMATION (PART 2) + SIMULATOR TRAINING (5 UC)**
Course element	**Ship's automation - simulator training**
Lecturer(s)	**Raf MAES**
Lecturer in charge	Raf MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2) Ship's automation (Part 1)			
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	-/12			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **-/12**	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student learns to maintain a control system on simulator.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12)			
Examination	Following Module 1.1 -	Following Module 1.2 -	**Following Module 2.1** **permanent evaluation**	Following Module 2.2 -
	Second session **practical test**			
Required study material	Lecturer's course text available.			

Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTRONICS (PART 2) (5 UC)**
Course element	**Ship's electronics / Analogue electronics (part 2) - theory**
Lecturer(s)	**Willem MAES**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's electronics (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Study of amplifiers with transistors, operational amplifiers used as comparator and power supplies. General applications of these components: general applications: transistors used as switch, oscillators with transistors, monostable oscillators with transistors, impulse generator for turning on thyristors, sure switching. Electronic transmitters with their sensors. Principles of powr electronics			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)			
Examination	**Following Module 1.1**	**Following Module 1.2 oral exam with written preparation**	**Following Module 2.1**	**Following Module 2.2**
	Second session oral exam with written preparation			
Required study material	Scientific calculator.			

Recommended preliminary competences	Mathematics Proficiency in General English is recommended
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTRONICS (PART 2) (5 UC)**
Course element	**Ship's electronics / digital techniques (part 2) - theory**
Lecturer(s)	**Pascal BOUQUET**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's electronics (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **12/-**	**Semester 2, Module 2.2** **12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Basic principles of industrial digital techniques. Introduction in microcontrollers			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Administer computer networks on board. (BA-SW-9)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1**	**Following Module 2.2**
	Second session **oral exam with written preparation**			
Required study material	Lecturer's course text available. Scientific calculator.			
Recommended preliminary competences	Mathematics Proficiency in General English is recommended			

Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTRONICS (PART 2) (5 UC)**
Course element	**Ship's electronics (part 2) - practice**
Lecturer(s)	**Pascal BOUQUET**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's electronics (Part 1) Maritime English (Part 2)			
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	-/32			
Semester + module(s)	**Semester 1, Module 1.1 -/8**	**Semester 1, Module 1.2 -/8**	**Semester 2, Module 2.1 -/8**	**Semester 2, Module 2.2 -/8**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Digital electronics lab: The student will create a realistic project and do tests on it. The student is required to make report of his project			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Correctly carry out administrative tasks and adequately complete documents. (BA-SW-4) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Administer computer networks on board. (BA-SW-9) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Analyse personal learning needs and transform this into initiatives to undertake additional professional training in the marine engineering domain. (BA-SW-17)			

Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 permanent evaluation with integrated practical test**
	Second session practical test			
Required study material	Lecturer's course text available. Scientific calculator.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTROTECHNICS (PART 2) + SIMULATOR TRAINING (5 UC)**
Course element	**Ship's electrotechnics (part 2) - theory**
Lecturer(s)	**Rik FLOREN, Marc STERKENS**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's electrotechnics (Part 1) Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Rectifiers: the half-bridge rectifier, the full-bridge rectifier, the controlled rectifier, average voltage after rectifying, power factor, harmonic distortion. Electric distribution and protection. High voltage safety, risk management and safe working procedures. Switching strategies and insulation testing.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Use and maintain high-voltage power (above 1000 volts) in a safe manner. (BA-SW-8)			
Examination	**Following Module 1.1 oral exam with written preparation**	**Following Module 1.2 oral exam with written preparation**	**Following Module 2.1**	**Following Module 2.2**
	Second session oral exam with written preparation			
Required study material	Lecturer's course text available.			

Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTROTECHNICS (PART 2) + SIMULATOR TRAINING (5 UC)**
Course element	**Ship's electrotechnics (part 2) - practice and high voltage exercises on simulator**
Lecturer(s)	**Rik FLOREN, Marc STERKENS**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's electrotechnics (Part 1) Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/36			
Semester + module(s)	**Semester 1, Module 1.1 -/8**	**Semester 1, Module 1.2 -/8**	**Semester 2, Module 2.1 -/8**	**Semester 2, Module 2.2 -/12**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Exercises on AC engines. Most of the emphasis here is laid on alternators (voltage regulation, synchronization, load sharing and external characteristics) and asynchronous motors. The safe handling and procedures of a high voltage installation. Insulation testing on HV components			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Safely use and repair electrical and electronic equipment and correctly adjust electrical and electronic control equipment. (BA-SW-7) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)			

Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2 permanent evaluation with integrated practical test**
	Second session practical test			
Required study material				
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S ELECTROTECHNICS (PART 2) + SIMULATOR TRAINING (5 UC)**
Course element	**Ship's electrotechnics (part 2) - simulator training**
Lecturer(s)	**Filip VAN GUTTE**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's electrotechnics (Part 1) Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2)			
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	-/12			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **-/12**	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Exercises to completely master the electric system (starting up generators, load-Sharing, restart procedures after black-out, load-shedding).			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Use and maintain high-voltage power (above 1000 volts) in a safe manner. (BA-SW-8) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Communicate correctly, effectively and professionally in English under all maritime circumstances (nautical-technical situations). (BA-SW-13) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1 permanent evaluation** / **Following Module 2.2** **Second session practical test**
Required study material	
Recommended preliminary competences	Proficiency in General English is recommended
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S DIESEL ENGINES (PART 3) + SIMULATOR TRAINING (5 UC)**
Course element	**Ship's diesel engines (part 3) - theory**
Lecturer(s)	**Vincent LEYSEN**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's diesel engines (Part 2) Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2)			
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	36/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**Semester 1, Module 1.2 12/-**	**Semester 2, Module 2.1 6/-**	**Semester 2, Module 2.2 6/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Study of the wear of various parts of the diesel engine. Look up preventive maintenance and practice with the help of manuals on ordering spare parts. Operation of the various control systems and of both the 2-stroke and 4-stroke engines.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)			
Examination	**Following Module 1.1**	**Following Module 1.2 oral exam with written preparation**	**Following Module 2.1**	**Following Module 2.2 oral exam with written preparation**
	Second session oral exam with written preparation			
Required study material	Lecturer's course text available.			

Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S DIESEL ENGINES (PART 3) + SIMULATOR TRAINING (5 UC)**
Course element	**Ship's diesel engines simulator training**
Lecturer(s)	**Vincent LEYSEN**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Ship's diesel engines (Part 2) Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/24			
Semester + module(s)	**Semester 1, Module 1.1 -/12**	**Semester 1, Module 1.2 -/12**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Learn to find the causes of perturbations and make reparations following specified procedures.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)			

Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation with integrated practical test**	Following Module 2.1 -	Following Module 2.2 -
	Second session practical test			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S AUXILIARY ENGINES (PART 2) INCLUDING IGF - SIMULATOR TRAINING (5 UC)**
Course element	**Ship's auxiliary engines (part 2) - theory**
Lecturer(s)	**Stefaan BUEKEN, Vincent LEYSEN**
Lecturer in charge	Stefaan BUEKEN, Tim COOLS
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Multidisciplinary simulator exercises (Part 1) Ship's auxiliary engines (Part 1) Maritime English (Part 2)			
Units of credit (UC)	3			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **12/-**	**Semester 2, Module 2.2** **12/-**
Learning objectives	At the end of the course, the student is expected to be able to:			

Course content	Theoretical approach to the cooling cycle. Extensive discussion of the operation based on the logp-h diagarmma and the T-s diagram. the functioning and function of all components is discussed. The theory is clarified on the basis of a test setup. Cooling capacity, COP and cold production coefficient are worked out by means of a calculation example. Discus the function and operation for oil-water and fuel-separators. Hydraulics: after discussing hydraulic pumps, motors, cylinders and control valves, various hydraulic circuits that we typically find on board are discussed. We always look for possible errors in the system and we look for improvements. Steering machine: we discuss the different types of steering machines with the corresponding hydraulic circuit. Drinking water supply on board: the function, operation and maintenance of the machines to make fresh water by evaporation at low pressure or by reversed osmosis are discussed in detail. Propulsion of the ship: the design of the ideal ship propeller. What is and how does an adjustable pitch propeller work and what are the advantages and disadvantages of this system?
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1** / **Following Module 2.2 oral and written exam** **Second session oral and written exam**
Required study material	Lecturer's course text available. Scientific calculator.
Recommended preliminary competences	Thermodynamics (Part 1)
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**SHIP'S AUXILIARY ENGINES (PART 2) INCLUDING IGF - SIMULATOR TRAINING (5 UC)**
Course element	**Ship's auxiliary engines (Part 2) including IGF - simulator training**
Lecturer(s)	**Stefaan BUEKEN, Tim COOLS**
Lecturer in charge	Stefaan BUEKEN, Tim COOLS
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Multidisciplinary simulator exercises (Part 1) Ship's auxiliary engines (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/24			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **-/12**	**Semester 2, Module 2.2** **-/12**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	Study of the auxiliaries under different working conditions. Understand and repair of faults. design and connect hydraulic circuits on the test panel, do some test on the circuits and find improvements or fauts. There are 2 IGF bunkerings og LNG (2 x 2h).			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** | **Following Module 1.2** | **Following Module 2.1 permanent evaluation** | **Following Module 2.2 permanent evaluation with integrated practical test** **Second session practical test**
Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**MARITIME RESOURCE MANAGEMENT - MRM & MRM - CASE STUDIES (3 UC)**
Course element	**Maritime resource management - MRM**
Lecturer(s)	**Ynse JANSSENS**
Lecturer in charge	Ynse JANSSENS
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	English			
Required preliminary credit(s)	Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	24/-			
Semester + module(s)	**Semester 1, Module 1.1 24/-**	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1 24/-**	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	This course indicates different aspects wherein an engineer can operate within a multicultural environment. Technics to control a crisis and a crowd by the watchkeeping officer or master and his operational team are introduced and explained.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Carry out leadership tasks: convince, negotiate, motivate, delegate, map time management, etc. (BA-SW-11) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)			

Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2**	**Following Module 2.1 permanent evaluation**	**Following Module 2.2**
	Second session second session impossible			
Required study material	Lecturer's course text available.			
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**MARITIME RESOURCE MANAGEMENT - MRM & MRM - CASE STUDIES (3 UC)**
Course element	**Maritime resource management - case studies**
Lecturer(s)	**Filip VAN GUTTE**
Lecturer in charge	Ynse JANSSENS
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture			
Other teaching methods				
Instruction language	English			
Required preliminary credit(s)	Maritime English (Part 2)			
Units of credit (UC)	1			
Hours of formal lecture/practical exercise	8/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	**Semester 2, Module 2.2 8/-**
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	This course indicates different aspects where in an engineer can operate within a multicultural environment. Technics to control a crisis and a crowd by the watchkeeping officer or chief engineer and his operational team are introduced and explained.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Function in an international, multicultural environment, demonstrate flexible attitude and behaviour, and act respectfully during interpersonal contact. (BA-SW-12)			
Examination	**Following Module 1.1**	**Following Module 1.2**	**Following Module 2.1**	**Following Module 2.2 permanent evaluation**
	Second session second session impossible			
Required study material				
Recommended preliminary competences				

Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 2), WATCHKEEPING, WORKSHOP PRACTICE (PART 3) AND SEMINARS (4 UC)**
Course element	**Multidisciplinary simulator exercises (part 2) and watch keeping**
Lecturer(s)	**Filip VAN GUTTE**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/60			
Semester + module(s)	**Semester 1, Module 1.1 -/30**	**Semester 1, Module 1.2 -/30**	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	The student learns to keep the engine room operational.			
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Safely handle repair tools, hand over the watch and fully supervise fuel transfers. (BA-SW-6) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)			

Examination	**Following Module 1.1 permanent evaluation**	**Following Module 1.2 permanent evaluation**	**Following Module 2.1**	**Following Module 2.2**
	Second session practical test			
Required study material				
Recommended preliminary competences				
Additional information				

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 2), WATCHKEEPING, WORKSHOP PRACTICE (PART 3) AND SEMINARS (4 UC)**
Course element	**Workshop practice (part 3) and seminars**
Lecturer(s)	**Stefaan BUEKEN, Tim JANSSENS, Marc STERKENS, Filip VAN GUTTE**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Practical exercises			
Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Multidisciplinary simulator exercises (Part 1) Maritime English (Part 2)			
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	-/48			
Semester + module(s)	**Semester 1, Module 1.1 -/12**	**Semester 1, Module 1.2 -/12**	**Semester 2, Module 2.1 -/12**	**Semester 2, Module 2.2 -/12**
Learning objectives	At the end of the course, the student is expected to be able to: - act independently in the manufacture and assembly of workpieces, motors and machines; - assess and adjust mechanical processes; - critically apply the correct welding technique in a given situation; - focused on organizing a task, both in groups and individually.			
Course content	In the workshop lab, the student will make safe and correct use of the tools, measuring instruments and machines (grinding disc, drilling machine, sanding belt, ...) that are regularly used by the marine engineer on board. The student masters shaft alignment, learns thread cutting on a lathe, brazing, plasma cutting and working with the cutting torch. The student designs, implements and tests a flange connection that will solve a given problem. The student learns on the basis of a group exercise on disassembly/assembly to work in a structured and organized manner. Finally, the student will collect and apply information himself according to the rules of the constructor.			

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2) - Run all propulsion-related motors and auxiliary circuits in a functionally safe manner and repair these in the event of anomaly, identify the cause of occurring machine errors and apply the standard repair procedures. (BA-SW-5) - Safely handle repair tools, hand over the watch and fully supervise fuel transfers. (BA-SW-6) - Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1 permanent evaluation** / **Following Module 1.2 permanent evaluation** / **Following Module 2.1 permanent evaluation** / **Following Module 2.2 permanent evaluation with integrated practical test** **Second session practical test**
Required study material	Lecturer's course text available. Safety clothing.
Recommended preliminary competences	Ship's diesel engines (part 2)
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**BACHELOR SCRIPTION (12 UC)**
Course element	**Bachelor term paper**
Lecturer(s)	**Promotor**
Lecturer in charge	Willem MAES
Educational programme	**Third year bachelor in marine engineering**

Other teaching methods				
Instruction language	Dutch/French			
Required preliminary credit(s)	Have succesfully passed all course elements of 1ME and 2ME			
Units of credit (UC)	12			
Hours of formal lecture/practical exercise	-/-			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to:			
Course content	A bachelor dissertation is a thorough scientific paper which enables the student to demonstrate, at the end of his bachelor study programme, his ability to complete a scientific and in-depth study of a subject or problem, related to the final goals of the study programme, and to formulate his conclusions in a proper, well structured written document (paper). This vast text should meet the formal requirements for a scientific publication and be linguistically, formally and stylistically correct.			
Learning outcomes	- Produce result-oriented work by planning efficiently and by thinking and acting in an accurate, creative and innovative manner. (BA-SW-10) - Correctly source and analyse scientific and technical information regarding marine engineering and assess in terms of application. (BA-SW-14) - Within a well-defined framework and under supervision, formulate and analyse a complex research question related to a practical aspect of marine engineering. Develop the research in a solution-oriented manner and produce a well-documented written report that complies with formal requirements. (BA-SW-15)			
Examination	**Following Module 1.1** **oral exam**	**Following Module 1.2** **oral exam**	**Following Module 2.1** **oral exam**	**Following Module 2.2** **oral exam**
	Second session **oral exam**			
Required study material				

Recommended preliminary competences	
Additional information	

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**ADVANCED TANKER TRAINING OIL (UC)**
Course element	**Advanced tanker training oil**
Lecturer(s)	**Guido DELVAUX, Ynse JANSSENS**
Lecturer in charge	Ynse JANSSENS
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods				
Instruction language	English			
Required preliminary credit(s)	Ship technique (Part 2)			
Units of credit (UC)	-			
Hours of formal lecture/practical exercise	18/18			
Semester + module(s)	**Semester 1, Module 1.1 6/-**	**Semester 1, Module 1.2 12/-**	**Semester 2, Module 2.1 -/18**	Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to: - correctly interpret physical and chemical properties of liquid oil cargoes; - safely plan, carry out and monitor loading, discharging and tank cleaning operations on board oil tankers; - take measures to prevent pollution of the environment by the release of oil or oily products; - take measures to prevent hazards; - check and follow the agreement with the prevailing legislation with emphasis on SOLAS, MARPOL Annex 1, OPA90 and the relevant technical codes and regulations concerning IG & COW; - operate the simulator; - name the different parts of the loading and unloading process; - outline the piping used to load and/or unload a tanker; - completely unload a tanker; - manage tank cleaning; - identify problems/errors and work out solutions/alternatives; - use and interpret the ODME; - act independently in case of alarms.			

Course content	The courses Advanced Tanker training Oil, Advanced Tanker training Gas and IGF en Advanced Tanker training Chemicals are an advanced continuation of the Basic Tanker training for Oil, Chemicals, Gas, and IGF. They start with a common theoretical part in which the student first elaborates on the study of cargo calculations on board oil, chemical and gas tankers within more advanced issues. In addition, the student gets acquainted with the phenomenon of hammering and studies the possibilities of static electricity on board liquid cargo ships. The course Advanced Tanker training - Oil deals minimum with the issues of storage, handling and transport of crude oil in accordance with the STCW2010 Specialized Training For Oil Tankers". - Model Course 1.02. The topics to be explored are Inert gas, crude oil washing, ullaging and sampling, STS, bunkering and bunker fraud. On the simulator, the student works on the basis of knowledge acquired in the 3rd Bachelor. In the Master the emphasis is on the oil tanker. In the labs, the student gets to know the activities in depth from the moment of arrival into port until the ship is fully unloaded. The following items will be covered: debottoming, ballasting, tank stripping, crude oil washing, internal stripping, ODME, heavy weather ballast, tank cleaning, and oil record book.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1 permanent evaluation** / **Following Module 2.2 oral exam with written preparation** **Second session oral exam with written preparation**
Required study material	Lecturer's course text available.
Recommended preliminary competences	Maritime English (part 2)

Additional information	- Baptist, C. (2000). *Tanker Handbook for Deck Officers.* Glasgow, UK: Brown, Son & Ferguson Ltd. - Bruhn, C. (latest ed.). *Dr. Verwey's Tank Cleaning Guide.* Dassendorf, Germany: ChemServe. - Huber, M. *(latest ed.). Tanker operations: A handbook for the person-in-charge.* Pensylvania, US: Schiffer Pub Ltd. - International Chamber of Shipping /OCIMF. *(latest ed.). Clean Seas Guide for Oil Tankers,* Edingburgh, UK: Witherby Seamanship International. - International Chamber of Shipping /OCIMF. *(latest ed.). International Safety Guide for Oil Tankers and Terminals (ISGOTT).* Edingburgh, UK: Witherbys Publishing. - International Chamber of Shipping. (latest ed.). *Clean seas guide for oil tankers.* London, UK: ISC. - International Chamber of Shipping. (latest ed.). *Ship to ship transfer guide.* London, UK: ISC. - International Chamber of Shipping*. (latest ed.). Tanker Safety Guide Chemicals. London, UK:* Marisec Publications. - International Chamber of Shipping*. (latest ed.). Tanker Safety Guide Liquified Gas. London, UK:* Marisec Publications. - International Maritime Organization. (1973-1978). *International Convention for the Prevention of Pollution from Ships (MARPOL) 1973-1978, as amended*. London, UK: IMO. - International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1990). *Inert Gas Systems (IMO-860E).* London, UK: IMO. - International Maritime Organization. (latest ed.). *International Code of Safety for Ships using gases or other low-flashpoint fuels (IGF)*. London, UK: IMO. - Intertanko. (latest ed.). *Effective crude oil washing.* Oslo, Norway: Intertanko. - Marton, G. (1992). *Tanker Operations: A Handbook for the Ship's Officer.* California , US: Cornell Maritime Press. - Solly, R. (2011). *Manual for oil tanker operations.* Edingburgh, UK: Witherby Seamanship International.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**ADVANCED TANKER TRAINING GAS & IGF (UC)**
Course element	**Advanced tanker training gas & IGF**
Lecturer(s)	**Guido DELVAUX, Werner JACOBS, Anne-Pascale MORNARD**
Lecturer in charge	Werner JACOBS
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods				
Instruction language	English			
Required preliminary credit(s)	Ship technique (Part 2)			
Units of credit (UC)	-			
Hours of formal lecture/practical exercise	18/18			
Semester + module(s)	**Semester 1, Module 1.1 6/-**	**Semester 1, Module 1.2 12/-**	**Semester 2, Module 2.1 -/9**	**Semester 2, Module 2.2 -/9**
Learning objectives	At the end of the course, the student is expected to be able to: - reconnaître les propriétés physiques et chimiques des cargaisons de gaz liquides/carburants à bord des navires soumis au code IGF; - planifier, conduire et suivre en toute sécurité les opérations de gaz et de carburant à bord des navires soumis au code IGF; - prendre des mesures pour prévenir la pollution de l'environnement par le rejet de gaz/carburant à bord des navires soumis au code IGF; - prendre des mesures pour prévenir les risques; - pouvoir vérifier et suivre la législation en vigueur.			

Course content	The courses Advanced Tanker training Oil, Advanced Tanker training Gas and IGF, and Advanced Tanker training Chemicals are a continuation and deepening of the module Basic Tanker training for Oil, Chemicals, Gas and IGF. They start with a common theoretical part in which the student first elaborates on the study of cargo calculations on board oil, chemical and gas tankers within more advanced issues. In addition, the student gets acquainted with the phenomenon of hammering and studies the possibilities of static electricity on board liquid cargo ships. In the course Advanced Tanker training Gas and IGF, the physical and chemical properties of liquefied gas are further discussed. Also the possible health effects after contact with the cargo or cargo vapours are explained. In the second chapter the student learns in detail how liquefied gases can be transported on a seagoing vessel, with an emphasis on the different tank designs. The third chapter is a selection of the existing legislation, with the importance for the operator of gas tankers as a leitmotif. The different types of ships are considered as well as the requirements regarding ventilation. In the next chapter the student gets acquainted with the different instruments and equipment specific to a gas tanker or IGF vessel and how to use them. After acquiring this subject matter, the different operations are discussed in detail, both on board an LNG, LPG and IGF ship. Finally, the student learns more about emergency procedures and communication with the shore terminal. The labs take place on the gas simulator. The emphasis is on practising the various operations as discussed in the theory. The student gets the opportunity to carry out the different operations on the simulator of LNG, LPG as well as IGF vessels.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - As a result of advanced knowledge and understanding of marine engineering and applied sciences, carry out practical operations in complex, work-related circumstances. (BA-SW-2)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1 permanent evaluation** / **Following Module 2.2 oral exam with written preparation and permanent evaluation** **Second session oral exam with written preparation**
Required study material	Lecturer's course text available.
Recommended preliminary competences	
Additional information	- Clucas, C. *(latest ed.)*. *Tanker Safety Training (Liquefied Gas), Specialised Level.* London, UK: Witherbys Publishing. - International Maritime Organization. *(latest ed.)*. *International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).* London, UK: IMO. - Society of International Gas Tanker and Terminal Operators. *(latest ed.)*. *Liquefied Gas Handling Principles on Ships and in Terminals*. London, UK: SIGTTO.

Hogere Zeevaartschool

ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**ADVANCED TANKER TRAINING CHEMICALS (UC)**
Course element	**Advanced tanker training chemicals**
Lecturer(s)	**Guido DELVAUX, Inez HOUBEN, Kathy SPEELMAN**
Lecturer in charge	Kathy SPEELMAN
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods	Group work			
Instruction language	English			
Required preliminary credit(s)	Ship technique (Part 2)			
Units of credit (UC)	-			
Hours of formal lecture/practical exercise	18/15			
Semester + module(s)	**Semester 1, Module 1.1 6/-**	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1 12/7.5**	**Semester 2, Module 2.2 -/7.5**
Learning objectives	At the end of the course, the student is expected to be able to: - recognise physical and chemical properties of hazardous liquid substances on board ships subject to the IBC Code; - select and apply correct, safe procedures in carrying out the various parts of cargo handling on chemical tankers in accordance with the IBC Code and Marpol; - identify and work out a solution to operational problems in accordance with relevant IMO legislation; - prepare a loading plan, execute it on a simulator and monitor and report the executed operations in a correct manner in accordance with the Marpol legislation; - take measures to prevent contamination of the environment by chemicals on board ships subject to the IBC Code.			

Course content	The courses Advanced Tanker training Oil, Advanced Tanker training Gas and IGF, and Advanced Tanker training Chemicals are an advanced continuation of course module Basic Tanker training for Oil, Chemicals, Gas and IGF. They start with a common theoretical part in which the student first elaborates on the study of cargo calculations on board oil, chemical and gas tankers within more advanced issues. In addition, the student gets acquainted with the phenomenon of hammering and studies the possibilities of static electricity on board liquid cargo ships. The Advanced Tanker training Chemicals also includes an advanced training programme that enables the student to create a safety culture on board chemical tankers. In this course, the student learns how to perform and control cargo operations, be familiar with the properties of chemical cargoes, take precautions to prevent hazards, apply health and safety measures, respond to emergencies, take fire safety measures, take precautions to prevent environmental pollution and monitor and verify compliance with legal requirements. The first part aims at students becoming familiar with the equipment, instruments and equipment used to handle the cargo of a chemical tanker. The relevant laws and regulations from the IBC Code and Marpol are discussed in detail. The course then addresses the need for proper planning, the use of safe procedures and checklists for various cargo handling operations. This enables the student to identify, solve and prevent operational problems. Finally, specific cargo handling challenges on chemical tankers are discussed. In the labs the student uses the cargo handling simulator for chemical tankers and can practise the different cargo operations, as discussed in the theory. The student can gain experience in a controlled environment and improve himself/herself in cargo handling on the simulator. The course is in accordance with A-V/1-1-3 of the STCW code.
Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Based on a sense of social responsibility (the environment, safety, etc.), act in a conscientious and stress-resistant manner during all emergencies, especially in the professional context of a marine engineer. (BA-SW-16)
Examination	**Following Module 1.1** / **Following Module 1.2** / **Following Module 2.1 permanent evaluation** / **Following Module 2.2 oral exam with written preparation and permanent evaluation** **Second session oral exam with written preparation**
Required study material	Lecturer's course text available.
Recommended preliminary competences	

Additional information	- International Chamber of Shipping /OCIMF. (2006). *International Safety Guide for Oil Tankers and Terminals.* Edingburgh, UK: Witherbys Publishing. - International Chamber of Shipping /OCIMF. (2013). *Ship to Ship Transfer Guide for Petroleum, Chemicals and Liquefied Gases.* Edingburgh, UK: Witherbys Publishing. - International Chamber of Shipping*. (latest ed.). Tanker Safety Guide Chemicals. London, UK:* Marisec Publications. - International Maritime Organization. (1973-1978). *International Convention for the Prevention of Pollution from Ships (MARPOL) 1973-1978, as amended*. London, UK: IMO. - International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - International Maritime Organization. (latest ed.). *International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code).* London, UK: IMO.

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ECTS Information Package

Programme	Bachelor in Marine Engineering
Course	**ADVANCED FIRE FIGHTING & TANKER FIRE FIGHTING (- UC)**
Course element	**Advanced fire fighting & Tanker fire fighting**
Lecturer(s)	**Klaas DE HERT, Guido DELVAUX, Inez HOUBEN, Raf MESKENS, Baziel SPITAELS**
Lecturer in charge	Anne-Pascale MORNARD
Educational programme	**Third year bachelor in marine engineering**

Method of teaching	Formal lecture with practical exercises			
Other teaching methods	Excursion Group work Demonstration			
Instruction language	Dutch/French + English			
Required preliminary credit(s)				
Course admission requirements	The candidate can only take part in this training module if he can graduate as Bachelor in Marine Engineering in the current academic year.			
Units of credit (UC)	-			
Hours of formal lecture/practical exercise	6/24			
Semester + module(s)	**Semester 1, Module 1.1** **6/-**	Semester 1, Module 1.2 -/-	Semester 2, Module 2.1 -/-	Semester 2, Module 2.2 -/-

Learning objectives	At the end of the course, the student is expected to be able to: - initiate, control and lead firefighting operations on board ships; - communicate correctly in case of firefighting on board ships when co-ordinating crews, act appropriately when controlling ventilation, fuel systems and control the organisation of first aid; - assess the consequences of the use of water for fire fighting on the stability of the ship and use this effectively with any necessary corrections; - know and control the processes/risks related to e.g. dry distillation and chemical processes in case of fire fighting; - take appropriate action when fighting fires involving hazardous materials; - know and understand hazards and precautions to be taken and apply when handling and storing materials such as paints; - know procedures and coordinate firefighting with shore-based crews; - organise and train firefighting teams to fight fires in the engine room, cargo spaces, galley or recreation areas and for certain types of fires; - inspect, monitor and maintain fire detection systems and fire-fighting equipment and their various components, without triggering, disabling or damaging them, as well as inspecting these systems and equipment to maintain their compliance with applicable laws and regulations; - investigate fire incidents and make reports on the origin and cause, with recommendations on corrective actions.

Course content	The "Advanced fire fighting & tanker fire fighting" course is **optional** and is composed as follows: - admission test to make sure the basic fire fighting knowledge is know; - 6 hours theoretical course at the AMA in module 1.1; - 3 days practical exercises, the first at the AMA and then 2 at a specialised fire fighting training centre, during the IHS-SA weeks. During this course, students receive a profound training according to the standards listed in the STCW A VI/3 (Advanced fire fighting), A V/1.1.1. en A V/1.2.1. (tanker fire fighting). -Fire-fighting procedures at sea and in port, with emphasis on organisation, tactics and command : A : upon receipt of a report or any other indication of fire, take all necessary initial actions to alert the necessary teams and ensure proper assistance. B : upon receipt of initial reports on the spot, make the assessment of the source of the fire and the actions to be taken to control and extinguish the fire. -Communication and coordination during firefighting, control ventilation/fuel systems and organisation towards injured persons : A : in a simulation, order the stopping of all appropriate systems, B : deploy the necessary extra manpower in fighting the fire and rescuing injured persons. -Take the appropriate measures to control water flows in relation to the stability of the ship, to preserve and control them at all times. -Take the right measures in case of fire fighting in case of dry distillation, chemical reactions and boiler installations. -Take proper measures when fighting fires with dangerous goods. -Take the right precautions and know the risks when storing and handling materials in a simulated fire drill in a specialised storage area. -Demonstrate command, control, communication and coordination of and with firefighting with shore based personnel. Organisation and training of firefighting teams -Preparation of an emergency plan, including allocation of personnel and description of tactics for containment/control and extinguishing a fire. -Prepare, conduct and evaluate an exercise for a particular type of fire. Inspection and maintenance of detection and extinguishing systems and accessories . -A : demonstration of knowledge of inspection and maintenance of different systems and their components. B : demonstration of knowledge related to the operation of different systems and their components. -Inspection of fire-fighting systems in relation to regulatory validity. Investigation and reporting after incidents with fire -Description of the process in designating the place of origin of a fire, using fire patterns, charred remains, structural damage, discoloration and bending or any other physical evidence. -Idem but identify and report the cause of a fire. -Describe effective countermeasures after evaluation of origin, cause and witness statements following a fire.

Learning outcomes	- Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for Engineering Officers on seagoing vessels. (BA-SW-1) - Act in accordance with the minimum standards of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the corresponding Code, as amended, for deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Co-ordinate operations and activities during 'first intervention' and correctly apply fire detection and safety system procedures. (BA-SW-3)
Examination	**Following Module 1.1 permanent evaluation** / **Following Module 1.2 permanent evaluation** / **Following Module 2.1 permanent evaluation** / **Following Module 2.2 permanent evaluation** **Second session second session impossible**
Required study material	Lecturer's course text available. Safety clothing.
Recommended preliminary competences	
Additional information	- International Maritime Organization. (1974). *International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended.* London, UK: IMO. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - International Maritime Organization. (2000). *International Code for Fire and Safety Systems (FSS Code)*. London, UK: IMO.

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Required preliminary credits - summary

Bachelor in Marine Engineering

Academic year 2021-2022

Second year bachelor in marine engineering

Science Faculty	
GENERAL MECHANICS	MATHEMATICS
MARITIME ENGLISH (PART 2)	MARITIME ENGLISH (PART 1)
Faculty of Marine Engineering	
THERMODYNAMICS (PART 2)	THERMODYNAMICS (PART 1)
STEAM INSTALLATIONS (PART 2)	STEAM INSTALLATIONS (PART 1)
STRENGTH OF MATERIALS	MATHEMATICS
SHIP'S AUTOMATION (PART 1)	MARITIME ENGLISH (PART 1) GENERAL ELECTRICITY MATHEMATICS
SHIP'S ELECTRONICS (PART 1)	MARITIME ENGLISH (PART 1) GENERAL ELECTRICITY MATHEMATICS
SHIP'S ELECTROTECHNICS (PART 1)	MARITIME ENGLISH (PART 1) GENERAL ELECTRICITY MATHEMATICS
SHIP'S DIESEL ENGINES (PART 2)	SHIP'S DIESEL ENGINES (PART 1)
MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1)	MARITIME ENGLISH (PART 1)
WORKSHOP PRACTICE (PART 2)	TECHNICAL DRAWING, WORKSHOP PRACTICE (PART 1)

Third year bachelor in marine engineering

Science Faculty	
MARITIME ENGLISH (PART 3)	MARITIME ENGLISH (PART 2)
Faculty of Marine Engineering	
SHIP'S AUTOMATION (PART 2) + SIMULATOR TRAINING	MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1) MARITIME ENGLISH (PART 2) SHIP'S AUTOMATION (PART 1)
SHIP'S ELECTRONICS (PART 2)	SHIP'S ELECTRONICS (PART 1) MARITIME ENGLISH (PART 2)
SHIP'S ELECTROTECHNICS (PART 2) + SIMULATOR TRAINING	SHIP'S ELECTROTECHNICS (PART 1) MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1) MARITIME ENGLISH (PART 2)
SHIP'S DIESEL ENGINES (PART 3) + SIMULATOR TRAINING	SHIP'S DIESEL ENGINES (PART 2) MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1) MARITIME ENGLISH (PART 2)
SHIP'S AUXILIARY ENGINES (PART 2) INCLUDING IGF - SIMULATOR TRAINING	MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1) SHIP'S AUXILIARY ENGINES (PART 1) MARITIME ENGLISH (PART 2)
MARITIME RESOURCE MANAGEMENT - MRM & MRM - CASE STUDIES	MARITIME ENGLISH (PART 2)
MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 2), WATCHKEEPING, WORKSHOP PRACTICE (PART 3) AND SEMINARS	MULTIDISCIPLINARY SIMULATOR EXERCISES (PART 1) MARITIME ENGLISH (PART 2)
Bachelor scription	
BACHELOR SCRIPTION	HAVE SUCCESFULLY PASSED ALL COURSE ELEMENTS OF 1ME AND 2ME
Nautical Faculty	
ADVANCED TANKER TRAINING OIL	SHIP TECHNIQUE (PART 2)
ADVANCED TANKER TRAINING GAS & IGF	SHIP TECHNIQUE (PART 2)
ADVANCED TANKER TRAINING CHEMICALS	SHIP TECHNIQUE (PART 2)
ADVANCED FIRE FIGHTING & TANKER FIRE FIGHTING *Advanced fire fighting & Tanker fire fighting*	*The candidate can only take part in this training module if he can graduate as Bachelor in Marine Engineering in the current academic year.*