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Antwerp Maritime Academy

Study guide

Academic Bachelor in Nautical Sciences

Academic year 2026-2027

First Year Bachelor in Nautical Sciences

Mandatory subjects	Th/Pr	UC
Nautical Faculty		
NAVIGATION (PART 1)	**48/48**	**8**
Nautical instruments	12/-	2
Navigation (part 1)	24/24	4
Chart Work (part 1)	12/24	2
REGULATIONS OF MARITIME TRAFFIC (PART 1)	**24/-**	**4**
Regulations of maritime traffic (part 1)	24/-	4
METEOROLOGY (PART 1)	**24/-**	**3**
Meteorology (part 1)	24/-	3
SHIP TECHNIQUE (PART 1)	**54/18**	**5**
Ship technique - theory	42/-	3
Ship technique - part 1	-/18	1
Basics of carriage of goods by sea	12/-	1
SAFETY TECHNOLOGY (PART 1)	**36/24**	**3**
Safety technology - theory	24/-	1
Safety technology - exercises	-/12	1
Fire safety - theory & Fire safety - excercises	12/12	1
STABILITY (PART 1)	**12/-**	**3**
Stability	12/-	3
ON BOARD TRAINING	**-/224**	**5**
On board training	-/224	5
Faculty of Sciences		
THEORY OF ELECTRICITY	**24/-**	**3**
Theory of electricity 1	12/-	2
Theory of electricity 2	12/-	1
SHIP'S CONSTRUCTION - PART 1	**24/-**	**3**
Ship's construction - part 1	24/-	3
GENERAL ECONOMICS	**24/-**	**3**
General economics	24/-	3
MATHEMATICS AND PHYSICS (PART 1)	**66/36**	**10**
Spherical trigonometry	6/3	1
Differential and integral calculus (part 1)	36/21	5
Vector calculus (part 1) and statics	12/6	2
Waves	12/6	2
PSYCHOLOGY: HUMAN ASPECTS OF NAVIGATION	**24/-**	**3**
Psychology: human aspects of navigation	24/-	3

MARITIME ENGLISH - PART 1	**36/24**	**7**
Maritime English - part 1	36/24	7

Elective subjects

Faculty of Sciences

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

Second Year Bachelor in Nautical Sciences

Mandatory subjects	Th/Pr	UC
Nautical Faculty		
NAVIGATION (PART 2)	**58/55.5**	**11**
Navigation (part 2)	24/24	4
Chart work (part 2)	12/24	3
Radar - part 1	6/7.5	2
ECDIS (part 1)	16/-	2
REGULATIONS OF MARITIME TRAFFIC (PART 2) AND MANOEUVRES (PART 1)	**42/6**	**4**
Regulations of maritime traffic (part 2)	24/-	1
Manoeuvres (part 1)	18/6	3
SHIP TECHNIQUE (PART 2)	**36/12**	**3**
Ship technique - theory	36/-	2
Ship technique (part 2) - exercises	-/12	1
SAFETY TECHNOLOGY (PART 2)	**42/-**	**5**
ISM	18/-	2
Search & Rescue (SAR)	12/-	2
ISPS	12/-	1
STABILITY (PART 2)	**12/-**	**3**
Stability (part 2)	12/-	3
Faculty of Sciences		
ELECTRONICS (PART 1)	**24/18**	**4**
Electronics (part 1) - theory	24/-	3
Electronics (part 1) - exercises	-/18	1
THERMODYNAMICS & SHIP'S CONSTRUCTION (PART 2)	**25/-**	**3**
Thermodynamics	15/-	2
Ship's construction (part 2)	10/-	1
BUSINESS ECONOMICS	**24/-**	**3**
Business economics	24/-	3
GENERAL INTRODUCTION TO LAW	**24/-**	**3**
General introduction to law	24/-	3
MATHEMATICS AND PHYSICS (PART 2)	**60/30**	**7**
Integral calculus (part 2) and statistical methods for scientific research	18/6	2
Vector calculus - part 2 and dynamics	24/12	3
Hydromechanics	18/12	2
CHEMISTRY	**36/12**	**5**
Chemistry - theory & Chemistry - practice	24/9	3

Third Year Bachelor in Nautical Sciences

Mandatory subjects	Th/Pr	UC
Nautical Faculty		
NAVIGATION (PART 3)	**24/108**	**8**
Navigation (part 3)	24/24	3
ECDIS part 2	-/20	1
Chart work (part 3) & Voyage planning	-/12	1
Radar - part 2: simulator	-/36	2
Telecommunication	-/16	-
REGULATIONS OF MARITIME TRAFFIC (PART 3) AND MANOEUVRES (PART 2)	**12/36**	**3**
Manoeuvres (part 2)	-/24	1
Manoeuvring simulator (part 2): simulator	-/12	1
Regulations for maritime traffic (part 3)	12/-	1
METEOROLOGY (PART 2) AND OCEANOGRAPHY	**24/-**	**3**
Meteorology (part 2) and oceanography	24/-	3
SAFETY TECHNOLOGY (PART 3) AND MARITIME ECOLOGY AND ENVIRONMENTAL LEGISLATION	**24/12**	**4**
Safety technology (Part 3)	12/12	2
Maritime ecology and environmental legislation	12/-	2
BASIC TANKER TRAINING (OIL, GAS, CHEM) & IGF	**24/12**	**3**
Basic tanker training (oil, gas, chem) & IGF	24/12	3
SHIP'S EXPLOITATION (PART 1)	**24/-**	**3**
Ship's exploitation (part 1)	24/-	3
STABILITY (PART 3)	**24/-**	**3**
Stability - part 3	24/-	3
BASIC DREDGING & OFFSHORE TRAINING	**24/8**	**3**
Basic Dredging & Offshore Training	24/8	3
Faculty of Sciences		
ELECTRONICS 2 AND INFORMATICS	**48/9**	**5**
Electronics (part 2)	24/9	3
Informatics and Cybersecurity	24/-	2
PROPULSION (PART 1)	**12/16**	**3**
Propulsion (part 1) - theory	12/-	2
Propulsion (part 1) - exercises	-/16	1
MARITIME ECONOMICS	**24/-**	**3**
Maritime economics	24/-	3
LAW OF THE SEA - BASICS	**24/-**	**3**
Law of the sea - basics	24/-	3
MARITIME MEDICINE (PART 2) AND TRAINING IN A HOSPITAL	**24/12**	**4**

Maritime medicine (part 2) and training in a hospital	24/12	4
MARITIME ENGLISH - PART 3	**24/-**	**3**
Maritime English - part 3	24/-	3
GENERAL AND INTERCULTURAL COMMUNICATION AND MCRM	**8/44**	**4**
General and Intercultural Communication	8/12	2
Maritime Crew Resource Management (MCRM)	-/32	2

Bachelor term paper and scientific research methodology

BACHELOR TERM PAPER AND SCIENTIFIC RESEARCH METHODOLOGY	**12/-**	**5**
Bachelor dissertation	-/-	4
Methodology of scientific research	12/-	1

Elective subjects

ADVANCED FIRE FIGHTING & TANKER FIRE FIGHTING	**6/24**	**-**
Advanced fire fighting & tanker fire fighting	6/24	-

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 1) (8 UC)**
Course element	**Nautical instruments (HZS-NW-NAV-NW160)**
Lecturer(s)	**Frederik BOUMANS**
Lecturer in charge	Klaas DE HERT
Educational programme	**First Year Bachelor in Nautical Sciences**

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: - possess a theoretical knowledge of nautical instruments on board merchant vessels; - know the limitations of the various nautical instruments discussed; - clarify the limitations of the various nautical instruments discussed; - formulate the accuracy of the various nautical instruments discussed.
Course content	During this course, students will acquire a basic theoretical understanding of the operation and use of various nautical instruments on board merchant ships. The course focuses on the instruments on the bridge. The following instruments are covered: - chronometer; - depth sounder; - log; - RADAR; - Various compasses; - autopilot; - rate-of-turn indicator; - bridge watch alarm system; - satellite navigation systems; - VHF DSC; - ECDIS; - Alarm indicator panels (fire alarm, watertight doors) - voyage data recorder

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module
1.1
-</td><td>Following Module
1.2
written exam</td><td>Following Module
2.1
-</td><td>Following Module
2.2
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<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 1) (8 UC)**
Course element	**Navigation (part 1)** **(HZS-NW-NAV-NW110)**
Lecturer(s)	**Frederik BOUMANS, Marieke UTEN**
Lecturer in charge	Klaas DE HERT
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	4
Hours of formal lecture/practical exercise	24/24
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: - display a position on the globe in coordinates and determine course and distance between 2 positions; - know the problems, solutions, and inaccuracies in translating the earth's surface onto a chart; - know the influences on course and heading, and to translate magnetic directions into true directions (and vice versa); - understand the movements of the celestial bodies, the coordinates of celestial bodies, and the corrections of the sextant.
Course content	The student becomes acquainted with the globe, the system of coordinates, and the difficulties in translating the real Earth into a mathematical model. Basic concepts such as course, heading, drift are explained, as are corrections from magnetic North. The student is also introduced to dead reckoning. He/She becomes acquainted with how the conversion is made from the globe to a chart, learns to determine course and distance according to different methods, and also calculate these on a Mercator and mean latitude chart. In addition, the student becomes acquainted with the movement of the celestial bodies, both in reality and from the perception of an observer on earth. The different coordinate systems and the navigation triangle are demonstrated, and the use of the sextant as well as the errors to be corrected are discussed.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
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written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 8/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Plotting sheets.
- Nautical Almanac. (latest ed.). Blue Lake, US: Paradise Cay Publications.
- Norie, J. W., Blance, G. (2007). Norie’s Nautical Tables: With an Explanation of Their Use. London, UK: Imray, Laurie, Norie & Wilson.
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Bowditch, LL.D. (2002). The American Practical Navigator, volume 1 & 2. US: Defense Mapping Agency Hydrographic Center.
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.
- Moore, P. (2010). Patrick Moore’s Astronomy: Teach Yourself. London, UK: Hodder & Stoughton. ISBN-9781444129779.
- Prinet, D. F. (2017). Coastal Navigation: for Class and Home Study. Victoria, US: FriesenPress. ISBN-9781525521232.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 1) (8 UC)**
Course element	**Chart Work (part 1)** **(HZS-NW-NAV-NW120)**
Lecturer(s)	**Frederik BOUMANS, Peter DOTSELAERE**
Lecturer in charge	Klaas DE HERT
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	2
Hours of formal lecture/practical exercise	12/24
Semester + module(s)	**Semester 1, Module 1.1 12/6** | **Semester 1, Module 1.2 -/3** | **Semester 2, Module 2.1 -/9** | **Semester 2, Module 2.2 -/6**
Learning objectives	At the end of the course, the student is expected to be able to: - have practical knowledge of the construction of a Mercator chart; - plot a position graphically on a chart; - solve the course triangle graphically with data from current, wind, as well as course and navigation in order to determine displacement with respect to land; - know the symbols used on paper charts; - apply the learned methods of construction to determine a future position; - use tide tables to calculate the tide height at a given time for a standard port; - use tide tables, calculate the moment when the tide will have a certain height for a standard port.
Course content	The student becomes acquainted with the use of nautical charts for determining the course to be steered, course travelled over ground, and a future position. To this end, the student understands the construction of a chart in the Mercator projection and knows the pros and cons of this projection. To this end, the student knows the abbreviations used on the cards. The student understands the origin and movements of the tides, and understands the calculation methods for the height and moment of a given water level.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Parallel ruler and compass.
- British Admiralty. (latest ed.). Chart 5055, Dover Strait. London, UK: United Kingdom Hydrographic Office.
- British Admiralty. (latest ed.). NP 5011, Symbols & Abbreviations used on Admiralty Charts. London, UK: United Kingdom Hydrographic Office.
- Hogere Zeevaartschool Antwerpen. HZS-Databook, Antwerpen, België: HZS.
- Norie, J. W., Blance, G. (latest ed.). Norie’s Nautical Tables: With an Explanation of Their Use. London, UK: Imray, Laurie, Norie & Wilson.
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Bowditch, LL.D. (2019). The American Practical Navigator, volume 1 & 2. US: Paradise Cay Publications.
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**REGULATIONS OF MARITIME TRAFFIC (PART 1) (4 UC)**
Course element	**Regulations of maritime traffic (part 1) (HZS-NW-NAV-NW150)**
Lecturer(s)	**Christophe SENSEN**
Lecturer in charge	Christophe SENSEN
Educational programme	**First Year Bachelor in Nautical Sciences**

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 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: - identify and classify all vessels in any kind of visibility by recognising daymarks, lights, and sounds; - track buoys/beacons correctly without endangering the vessel.
Course content	The student becomes acquainted with part A (regulation 3), parts C, D, E and annexes of the 'International Regulations for Preventing Collisions at Sea' (COLREGs - London, 1972) updated with the most recent amendments. The student acquires knowledge in identifying and classifying different vessels, both in sight of each other and in restricted visibility, thereby recognising sounds, lights, and daymarks. The student is introduced to the latest version of the 'IALA Maritime Buoyage System'. The student acquires knowledge in identifying and classifying buoys/beacons in regions 'A' and 'B', both on a chart and at sea.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
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written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
-</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- British Admiralty. (2012). NP735 IALA Maritime buoyage System, Combined Cardinal and Lateral System, as amended. London, UK: United Kingdom Hydrographic Office.
- International Maritime Organization. (2003). Colreg: Convention on the International Regulations for Preventing Collisions at Sea, as amended. London, UK: IMO.
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Deseck. P. (2007). International Regulations for Preventing Collisions at Sea. Ostend, Belgium: Maritime Knowhow.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**METEOROLOGY (PART 1) (3 UC)**
Course element	**Meteorology (part 1)** **(HZS-NW-NAV-NW140)**
Lecturer(s)	**Laura DE WEL**
Lecturer in charge	Anne-Pascale MORNARD
Educational programme	**First Year Bachelor in Nautical Sciences**

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 -/- 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: - use the meteorological instruments and interpret their results correctly; - apply the available meteorological data in the planning of the voyage; - know the characteristics of the different weather systems and apply them to the planning of the voyage; - describe the importance of atmospheric classifications in relation to, among others, the greenhouse effect and the daily course of temperatures; - explain the origins and classification of the various weather phenomena (clouds, precipitation, wind, frontal depression, etc.); - analyse and interpret the synoptic weather charts.
Course content	The student is introduced to the basic concepts in meteorology. He/she studies the various meteorological instruments and their importance. The student becomes acquainted with the atmosphere, the different ways of dividing it, and discusses its meteorological importance. He/she learns how winds are generated. He/she learns to recognise the different types of clouds and precipitation, as well as to explain their development. The student learns about the formation of a frontal depression, the different weather systems and the synoptic weather charts.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- British Admiralty. (2016). NP 100, The Mariner’s Handbook, (11th ed.). London, UK: United Kingdom Hydrographic Office.
- Cornish, M., Ives, E. (latest ed.). Maritime Meteorology. London, UK: Thomas Reed Publications.
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.
- Meteorological Office. (latest ed.). Marine Observer's handbook. London, HMSO.
- Meteorological Office. (latest ed.). Meteorology for mariners. London, UK: HMSO.
- Van der Ham, C.J., Korevaar, C.G., Moens, W.D., Stijnman, P.C. Meteorologie en oceanografie voor de Zeevaart, Emdijk, Nederland: De Boer Maritiem.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**SHIP TECHNIQUE (PART 1) (5 UC)**
Course element	**Ship technique - theory (HZS-NW-EXP-NW101)**
Lecturer(s)	**Raf MESKENS**
Lecturer in charge	Raf MESKENS
Educational programme	**First Year Bachelor in Nautical Sciences**

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	42/-			
Semester + module(s)	**Semester 1, Module 1.1 12/-**	**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: - know the characteristics and basic dimensions of a ship; - be able to recognise the different types of ships and explain their loading/purpose; - apply the different units, also use English units of measurement and convert them to SI units; - know the different ropes, hawsers, and (steel) cables and their production, properties, and characteristics; - know the different pulleys and tackles; - know the basic principles, construction, components of various types of cranes and loading gear; - know the different ways of mooring and to apply the corresponding procedures and forces involved; - know the different anchors and apply the corresponding procedures at anchor, including understanding the different forces involved; - know the different procedures and materials used to seal openings on board a ship and apply maintenance procedures; - know, understand, and apply the necessity and principles of air handling on board in a theoretical exercise.			

<table>
<tr><td>Course content</td><td>In this course the student becomes acquainted with the concept of ‘ship,’ and receives an overview of the most important deck equipment on board a ship. The student will be prepared to perform the duties of a watchkeeping officer in an effective manner and later, as first officer, he/she should be able to take responsibility for inspecting and maintaining deck equipment.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
written exam</td><td>Following Module 2.2
-</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Clarck, I.C. (latest ed.). Mooring and Anchoring Ships Vol 1 - Principles and Practice. London, UK, The nautical Institute.
- International Labour Organization. (1979). International Convention concerning Occupational Safety and Health in Dock Work 1979, as amended. London, UK: International Labour Organisation,
- 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.
- Oil Companies International Marine Forum. (latest ed.). Guidelines and recommendations for the safe mooring of large ships at piers and sea islands. London, UK: OCIMF.
- van Dokkum, K. (latest ed.). Ship Knowledge. Enkhuizen, The Netherlands: Dokmar.
- Vervloesem, W. (latest ed.). Ship Survey and Audit Companion / A practical guide. London, UK: The Nautical Institute.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SHIP TECHNIQUE (PART 1) (5 UC)**
Course element	**Ship technique - part 1 (HZS-NW-EXP-NW102)**
Lecturer(s)	**Wikke WITTEVEEN**
Lecturer in charge	Raf MESKENS
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	Excursion Demonstration
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	1
Hours of formal lecture/practical exercise	-/18
Semester + module(s)	Semester 1, Module 1.1 -/- | **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: - select the correct type of rope and knot for each application; - interpret a simple Morse message by means of light signals; - interpret and give a flag signal; - be able to prepare simple tasks on board and function efficiently and safely as an active team member in standard operations.
Course content	The course consists of three parts. The student learns to transmit and interpret Morse and flag code by self-study using the information provided. A test is taken during the last lesson. During the lessons, the student should perform some traditional but still relevant techniques themselves. Based on the assignment and demonstration videos, the student.e analyses the actions. The student determines the risks, chooses the best suitable knots from the course, determines the required personal protective equipment, formulates a plan of execution and finally demonstrates the technique. During the final lesson, the student demonstrates some absolute basic knots and techniques as a final test. These are learned through self-study and through use in the assignments.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2 permanent evaluation</td><td>Following Module 2.1 permanent evaluation</td><td>Following Module 2.2 permanent evaluation with integrated practical test</td></tr>
<tr><td colspan="4">Second session
practical test</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Safety clothing.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SHIP TECHNIQUE (PART 1) (5 UC)**
Course element	**Basics of carriage of goods by sea (HZS-NW-EXP-NW106)**
Lecturer(s)	**Marieke UTEN**
Lecturer in charge	Raf MESKENS
Educational programme	**First Year Bachelor in Nautical Sciences**

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** **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: - describe the role of the main and supporting industries in the maritime sector; - form an overall picture of the maritime economic situation; - reflect on the role of the various intermediaries in maritime transport; - Explain the function of bill of lading and contract of affreightment.			
Course content	The student receives a general introduction about the maritime sector. On the basis of the life cycle of a ship, the student first becomes acquainted with the various main and supporting industries. The main maritime organisations are presented and a picture of the maritime economic situation is provided. In the second part, he/she becomes acquainted with the different actors in maritime transport. In addition, the most important documents (such as bill of lading and contract of affreightment) are presented.			
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8) - Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)			

Examination	**Following Module 1.1 written exam**	Following Module 1.2 -	Following Module 2.1 -	Following Module 2.2 -
	Second session written exam			
Caesura measures				
Required study material	- Lecturer's course text available. - No calculator allowed.			
Recommended preliminary competences				
Additional information				

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SAFETY TECHNOLOGY (PART 1) (3 UC)**
Course element	**Safety technology - theory (HZS-NW-EXP-NW103)**
Lecturer(s)	**Inez HOUBEN**
Lecturer in charge	Raf MESKENS
Educational programme	**First Year Bachelor in Nautical Sciences**

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: - understand the functioning of the IMO, situate the various international conventions, codes, and other legislative instruments in terms of safety, understand the purpose and content and provide an overview of the links between the various components; - know the content of Chapter III of the SOLAS Convention and the LSA Code; - comply with the theoretical requirements set out in STCW code A-VI 1-3 'Specification of minimum standard competence in personal survival techniques', A-VI 1-3 'Specification of minimum standard of competence in elementary first aid', A-VI 1-4 'Specification of minimum standard of competence in personal safety and social responsibilities', and A-VI 2-1 'Proficiency in survival craft and rescue boats, other than fast rescue boats'; - comply with the theoretical requirements set out in A-VI 6-1 of the STCW code with regard to 'security awareness' as stipulated in the ISPS code - apply the theoretical knowledge and skills related to the aforementioned parts of the STCW code in a professional environment; - Act accurately and effectively in professional emergency situations.

Course content	The student acquires basic knowledge of maritime safety and becomes familiar with the role of the IMO and the main international safety regulations, including SOLAS and MARPOL. Particular attention is given to lifesaving appliances, personal survival techniques, elementary first aid, security awareness, and safe working practices on board. The course also addresses topics such as fatigue, bullying and harassment, and responsible behaviour in a maritime environment. Through this course, the student develops the knowledge and skills required to operate safely and responsibly at sea. The STCW competencies related to these topics are covered within the course.
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2) - Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
Examination	<table><tr><td>Following Module 1.1 -</td><td>**Following Module 1.2** **written exam**</td><td>Following Module 2.1 -</td><td>Following Module 2.2 -</td></tr><tr><td colspan="4">**Second session** **written exam**</td></tr></table>
Caesura measures	
Required study material	- Lecturer's course text available. - No calculator allowed.
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. (latest ed.). *Life Saving Appliances Code (LSA Code).* London, UK: IMO.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SAFETY TECHNOLOGY (PART 1) (3 UC)**
Course element	**Safety technology - exercises (HZS-NW-EXP-NW104)**
Lecturer(s)	**Dries VAN ZUNDERT, Wikke WITTEVEEN**
Lecturer in charge	Raf MESKENS
Educational programme	**First Year Bachelor in Nautical Sciences**

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: - reproduce in an accurate and insightful manner the knowledge and skills offered in the study material and during the lectures; - create a cohesive overview of the various components of the course content; - use the knowledge and skills acquired in other programme modules; - apply the acquired knowledge and skills with regard to the module in a professional environment; - act accurately and effectively in professional emergency situations.			

<table>
<tr><td>Course content</td><td>During practical sessions the student practises the following items, in accordance with STCW code A-VI 1-1 ‘Specification of minimum standard competence in personal survival techniques’, A-VI 1-3 ‘Specification of minimum standard of competence in elementary first aid’, A-VI 1-4 ‘Specification of minimum standard of competence in personal safety and social responsibilities’, and A-VI 2-1 ‘Proficiency in survival craft and rescue boats, other than fast rescue boats’

- takes the lead during and after the launching of a lifeboat;
- operates and starts the engine of a lifeboat;
- launches a lifeboat, practises procedures while on board life rafts or lifeboats;
- Rights a capsised raft;
- learns rescue and survival techniques without a life raft.
- The student practises with and discusses location devices:
- signalling equipment;
- pyrotechnic devices such as manual hoist lights, parachute signals, and other emergency beacons.
- The student practises with and discusses all the different personal life-saving appliances:
- wearing and using life jackets, survival suits;
- working safely with PPE;
- communicating with others in relation to on-board tasks.
- The student practises with and discusses first aid equipment:
- Actions in emergency situations;
- basic life support and resuscitation;
- treatment for wounds, bleeding, burns, scalds, shocks, fractures, dislocations, and soft tissue injuries;
- hypothermia.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
-</td></tr>
<tr><td colspan="4">Second session
second session impossible</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Safety clothing.

- No calculator allowed.</td></tr>
</table>

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.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SAFETY TECHNOLOGY (PART 1) (3 UC)**
Course element	**Fire safety - theory &** **Fire safety - excercises** **(HZS-NW-EXP-NW107 HZS-NW-EXP-NW108)**
Lecturer(s)	**Raf MESKENS** **Frederik BOUMANS, Dries VAN ZUNDERT**
Lecturer in charge	Raf MESKENS
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture Practical exercises			
Other teaching methods	Excursion Group work Demonstration			
Instruction language	Dutch/French Dutch/French + English			
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: - understand and apply the principles of fire and explosion; - reduce the human risk factor as much as possible; - consult and understand the various laws and regulations in force; - in the event of fire, limit the risks to the ship, its cargo, and the surrounding area; - know and understand the principles of containment, control and firefighting in their place of origin; - understand the need for different ways and means of evacuating passengers and crew; - define various firefighting strategies; - recognise and understand the link between good preparation/organisation and a structural firefighting method; - develop practical exercises for training crews; - implement the practical requirements set out in A-VI 1-2 'Fire prevention and fire fighting' of the STCW-code; - demonstrate the practical knowledge and skills such as, for example, spraying techniques with fire hoses and progressing techniques with firefighting equipment and respiratory protection with regard to A-VI 1-2 'Fire prevention and firefighting' of the STCW code during simulated examples; - respond correctly to fire situations during controlled exercises in a specialised training centre; - possess the skills to help accurately and effectively in professional fire emergencies.

Course content	The student learns how to fight fires on board ships, in accordance with STCW A-VI 1-2 'Fire prevention and firefighting'. Both prevention, development, detection and fighting of a fire are covered. The basis of the course is the SOLAS convention chapter II-2 and the accompanying FSS code. The theoretical course consists of chapters structured around the 4 main areas of fire theory, namely prevention, development, detection and firefighting. In the first chapters, the student receives a theoretical explanation of fire and corresponding terms and definitions, different basic principles such as the fire triangle and the different fire classes. Subsequently, the student is introduced to the different causes of fire, according to their specific causes and special, high-risk areas on board the ship. Via the theoretical treatment of risk management, detection and control, contained in the construction of the ship, the student becomes acquainted with the various available detection systems on board. The theory of firefighting is applied in full detail, ranging from the organisation on board, different systems and equipment on board, to the development of different strategies depending on the type of ship. **Before the student may start the fire safety - exercises course, he/she must have passed the fire safety - theory course. In addition, to ensure safety, the student will receive instructional videos and other crucial information in advance and will have to pass a test before the start of practical classes in order to participate in the fire safety - exercises course.** During the practical sessions, the student receives basic training in firefighting. The following elements are practised: - breathing apparatus: the student learns to perform the correct procedure and checks, name the various components, quickly connect and disconnect the air supply, set up and use the equipment fluently; - progressing in group: understanding why and how to carry this out, necessity for good communication between team members, performing a correct stairs procedure; - fire hoses: correctly unrolling, emptying, and rolling up fire hoses; - fire hose management: correctly align and connect fire hoses, place manifolds correctly and know how to connect them; - fire nozzle techniques and 'water management': importance of water management and the correct operation of 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 deep fryer and a person; - EEBD (different types); - taking immediate appropriate action in the event of a fire (fire classes); - organisation in firefighting team: group collaboration, assertiveness, communication, and allocation of tasks.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr>
<tr><td colspan="4">Second session
written exam
second session impossible</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Safety clothing.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- 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.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**STABILITY (PART 1) (3 UC)**
Course element	**Stability** **(HZS-NW-EXP-NW105)**
Lecturer(s)	**Ynse JANSSENS**
Lecturer in charge	Ynse JANSSENS
Educational programme	**First Year Bachelor in Nautical Sciences**

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: - have theoretical knowledge of the stability of ships; - be able to identify markings on the hull of ships; - illustrate how centre of gravity and centre of pressure change with shifting weights; - interpret loading scales; - Critically assess a GZ curve and compile it independently; - find and calculate solutions to simple stability issues.
Course content	The student receives an introduction to the study of the stability of ships. The course covers, among other things, the following items: displacement, deadweight, draughts, buoyancy, type A and type B vessels, FWA (Fresh Water Allowance), TPC (Tonnes per Centimetre Immersion), 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 (free liquid surface).
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)

<table>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- 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.
- International Maritime Organization. (latest ed.). Ships' Routeing. 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.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**ON BOARD TRAINING (5 UC)**
Course element	**On board training (HZS-NW-NAV-NW901)**
Lecturer(s)	**Patricia VAN LANGENHOVEN**
Lecturer in charge	Patricia VAN LANGENHOVEN
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	Dutch/French + English
Required preliminary credit(s)	
Units of credit (UC)	5
Hours of formal lecture/practical exercise	-/224
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: - read and use a nautical chart; - apply variation and deviation; - fill in the ship's logbook; - keep a lookout and report contacts in degrees or areas; - carry out positioning by means of GPS, visual compass readings and radar; - steer by compas; - use portable radio communication equipment; - measure altitudes of celestial bodies with a sextant; - calculate tidal heights using tide tables; - carry out meteorological observations; - identify safety on board seagoing vessels.
Course content	The student receives an initial introduction to his/her future profession. The student learns how he/she can already apply certain knowledge from the first semester on board a seagoing vessel. The emphasis is placed on communication and teamwork. Depending on the possibilities during the voyage, certain competences are validated in the Cadet Training Record Book, being minimum 1.3.4, 1.4.1, 1.5.1, 1.6.1, 1.6.2, 1.6.4, 1.6.5, 1.7.2, 1.8.1, 1.9.3, 1.10.1, 1.10.4, 2.1.6, 2.3.1, 2.3.2, 2.4.3, 2.4.10, 2.5.1, 2.5.4, 2.5.5, 2.5.6, 2.6.1, 2.6.2, 5.1.1, 7.3.2, 7.4.4 and 8.2.1. The student will steer at least 4 hours by compass by day and by night.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
-</td></tr><tr><td colspan="4">Second session
second session impossible</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Parallel ruler and compass.
- Safety clothing.
- International Shipping Federation. (latest ed.). Cadet Training Record Book Deck. London, UK: ISF.
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**THEORY OF ELECTRICITY (3 UC)**
Course element	**Theory of electricity 1 (HZS-WE-TE-NW111T)**
Lecturer(s)	**Jonas JOOS**
Lecturer in charge	Peter BUEKEN
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	Tutoring
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 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: - have theoretical knowledge of the quantities and laws of electrostatics; - apply the laws of electrostatics to basic problems; - have theoretical knowledge of the variables and laws of electrodynamics; - have an understanding of the application of the basic laws of electrodynamics to the analysis of DC voltage networks; - possess theoretical insight into the behaviour of capacitors, and on the basis thereof be able to explain transient phenomena in RC circuits; - solve DC voltage networks by means of these methods of analysis and, in particular, fluently determine serial and parallel equivalent resistors and capacitors and applying the principles of current and voltage division.
Course content	The student is introduced to electrostatics and direct current theory. He/she learns techniques for predicting the behaviour of resistors and calculating the variables of direct current networks. The student is also introduced to the behaviour of capacitors and transient phenomena in capacitors. The student continuously concretizes the subject matter by means of examples and exercises. The student acquires knowledge, insights, and skills related to electricity to support other courses and/or writing of a bachelor/master thesis.
Learning outcomes	- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)

<table>
<tr><td>Examination</td><td>
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<tr><td>Following Module 1.1
written exam</td><td>Following Module 1.2
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<tr><td colspan="4">Second session
written exam</td></tr>
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<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Mathematics</td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**THEORY OF ELECTRICITY (3 UC)**
Course element	**Theory of electricity 2 (HZS-WE-TE-NW113T)**
Lecturer(s)	**Peter BUEKEN**
Lecturer in charge	Peter BUEKEN
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	Tutoring Demonstration
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: - possess basic theoretical insight into the phenomenon of magnetic induction, and on the basis thereof be able to explain the behaviour of coils and transient phenomena in RL circuits; - understand the analogy and distinction between resistor, capacitor, and coil; - possess a theoretical understanding of how to generate alternating current, as of its characteristics; - analyse simple AC voltage networks by means of active and reactive power; - understand the behaviour of resistors, coils, and capacitors in AC voltage networks.
Course content	The student is introduced to electromagnetism and alternating current theory. He/she acquires insight into transient phenomena in coils. He/she learns techniques for predicting the behaviour of components and calculating the variables of circuits in alternating current networks. The student continuously concretises the subject matter by means of examples and exercises. The student acquires knowledge, insights, and skills related to electricity to support other courses and/or writing of a bachelor/master thesis.
Learning outcomes	- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)

<table>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
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written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
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<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Mathematics</td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SHIP'S CONSTRUCTION - PART 1 (3 UC)**
Course element	**Ship's construction - part 1 (HZS-WE-TE-NW112T)**
Lecturer(s)	**Remke WILLEMEN**
Lecturer in charge	Remke WILLEMEN
Educational programme	**First Year Bachelor in Nautical Sciences**

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 -/-	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: - possess theoretical knowledge of shipbuilding materials: production process and mechanical properties; - be able to recognise and correctly name different parts of a ship; - know and understand the entire building process from concept to finished ship; - read ship plans, understand the purpose, content, and different applications; - possess insight into the structure of a ship; - possess insight into material stresses and loads; - possess insight into damage.			

<table>
<tr><td>Course content</td><td>In the first part the student becomes acquainted with important concepts regarding the metals used in shipbuilding, and this in relation to the production process of the metals, their microstructure, and the different types of destructive and non-destructive tests. This information will then be linked to the rules laid down by the Classification Societies. Subsequently, the basic concepts of the strength of materials are discussed, so that the student can become acquainted with the concept of internal stress in a material and the different types of stresses. Finally, a link is established between these stresses and loads applied to the structure of a ship.

During the second part, ste student discovers the building process of the ship with an emphasis on ship design, the production process and relevant ship plans.

In the third part, the student becomes acquainted with the assembling of a ship's hull by a detailed presentation of the ship's structure. The various structural elements are discussed and their contribution to the strength of the ship. This part is followed by a presentation of the typical building characteristics of different types of ships. Finally, some important mechanisms are introduced: the steering gear, the propeller shaft seal, and the propeller.

The fourth and final part brings together knowledge of shipbuilding materials, stresses, the building process as well as the construction of a ship by delving into the subject of damage.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
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-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Eyres, D.J. & Bruce, G.J. (2012). Ship Construction (7th ed.). London, UK: Butterworth-Heinemann. ISBN: 9780080972398
- 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.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**GENERAL ECONOMICS (3 UC)**
Course element	**General economics (HZS-WE-HT-NW111)**
Lecturer(s)	**Kateryna GRUSHEVSKA**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**First Year Bachelor in Nautical Sciences**

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 -/-	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: - explain the various concepts of micro- and macroeconomics; - calculate market balances and elasticity of supply and demand; - determine the maximum profit in the event of monopoly and competition; - analyse and evaluate economic graphs and articles.			
Course content	The student becomes acquainted with the following topics of microeconomics: utility, market forms, supply and demand, elasticity, and profit maximisation. The student also becomes acquainted with macroeconomics: international trade, gross domestic product, the labour market, money, and inflation.			
Learning outcomes	- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)			
Examination	Following Module 1.1 -	Following Module 1.2 -	Following Module 2.1 -	**Following Module 2.2** **written exam**
	Second session **written exam**			
Caesura measures				

Required study material	- Lecturer's course text available. - No calculator allowed.
Recommended preliminary competences	
Additional information	- De Velder, S. De Cnuydt, I. (laatste ed.). *Economie vandaag*. Gent, België: Academia Press. - Sloman J. (2011). *Principes d'économie*. Paris, France: Pearson Education France.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MATHEMATICS AND PHYSICS (PART 1) (10 UC)**
Course element	**Spherical trigonometry (HZS-WE-TE-NW140)**
Lecturer(s)	**Peter BUEKEN, Katrijn VERHASSELT**
Lecturer in charge	Peter BUEKEN
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Portfolio Tutoring
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	1
Hours of formal lecture/practical exercise	6/3
Semester + module(s)	**Semester 1, Module 1.1 6/3** | 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: - use a calculator to calculate trigonometric and cyclometric values; - determine precisely all the unknown dimensions of a rectangular spherical triangle by using two known dimensions and Napier's rule; - determine whether an unknown side or angle of a rectangular spherical triangle should be acute or obtuse by making use of other, known dimensions of the triangle; - determine precisely all the unknown dimensions of an oblique spherical triangle (with three given sides or with two given sides and the enclosed angle) using the cosine rule and the cotangent rule.
Course content	The student becomes acquainted with spherical triangles and the relations that exist between the dimensions of such a spherical triangle. He/she then learns to apply these relationships to solve rectangular and oblique spherical triangles.
Learning outcomes	- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-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** **Second session written exam**

Caesura measures	
Required study material	- Lecturer's course text available. - Ordinary scientific calculator and graphic scientific calculators allowed.
Recommended preliminary competences	Mathematics
Additional information	

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MATHEMATICS AND PHYSICS (PART 1) (10 UC)**
Course element	**Differential and integral calculus (part 1) (HZS-WE-TE-NW141)**
Lecturer(s)	**Peter BUEKEN, Jonas JOOS, Deirdre LUYCKX, Katrijn VERHASSELT**
Lecturer in charge	Peter BUEKEN
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Portfolio Tutoring
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	5
Hours of formal lecture/practical exercise	36/21
Semester + module(s)	**Semester 1, Module 1.1 6/-** | **Semester 1, Module 1.2 12/9** | **Semester 2, Module 2.1 12/6** | **Semester 2, Module 2.2 6/6**
Learning objectives	At the end of the course, the student is expected to be able to: - apply elementary techniques from the differential and integral calculus correctly to concrete examples (e.g. calculating the derivative, indefinite, and definite integral of a given function, calculating an approximate value for a definite integral, calculating the trigonometric and exponential representation of a complex number); - apply these calculation techniques to solve simple mathematical problems, such as calculating extreme values of a function and the tangent to a curve, calculating limits with l'Hôpital's rule, determining areas, volumes, centres of gravity, and moments of inertia of figures, calculating powers and roots of complex numbers with de Moivre's formula; - solve simple composite problems by dividing them into a series of successive sub-problems, determining or collecting the necessary data, and carrying out the required operations in the required sequence while using the appropriate calculation technique.
Course content	The student becomes acquainted with the most important techniques from the differential and integral calculus, in particular the calculation of the derivative and differential of a function of one variable, as well as the indefinite and definite integrals of such functions. Furthermore, he/she also learns the geometric and physical meaning of these elements and learns to use these techniques for solving simple and composite mathematical problems. He/she also gets to know complex numbers and learns to calculate with these numbers in an efficient way and to use these numbers to solve mathematical problems.

<table>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
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written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
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</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Mathematics</td></tr>
<tr><td>Additional information</td><td>- Ayres, F., & Mendelson, E. (2013). Schaum’s outlines calculus. Schaum’s outline series (6th ed.). New York, NY: McGraw-Hill.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MATHEMATICS AND PHYSICS (PART 1) (10 UC)**
Course element	**Vector calculus (part 1) and statics (HZS-WE-TE-NW142)**
Lecturer(s)	**Peter BUEKEN, Katrijn VERHASSELT**
Lecturer in charge	Peter BUEKEN
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Portfolio Tutoring Demonstration
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	2
Hours of formal lecture/practical exercise	12/6
Semester + module(s)	**Semester 1, Module 1.1** **6/3** **Semester 1, Module 1.2** **6/3** 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: - represent vectors in a two- and three-dimensional space in different ways, and use these representations for arithmetic with vectors; - draw up equations of planes and lines in three-dimensional space; - calculate a sum, scalar and cross product, and use the meaning of these constructions to solve simple problems; - calculate a vector and scalar projection, and interpret this construction correctly; - apply the calculation of a vector sum, a scalar and cross product to determine resulting forces, torques, and their components; - understand the basic laws of statics and apply them in a structured way to the equilibrium analysis of mechanical systems; - taking into account material properties, determine axial deformation and transverse strain under the influence of normal stress.

<table>
<tr><td>Course content</td><td>The student becomes acquainted with the following important concepts from vector calculus:
- vectors in the plane and in the three-dimensional space (the term vector, free and bound vectors, modulus of a vector, components of a vector, sum and difference of vectors, scalar multiple, scalar product, cross product, triple product, scalar and vector projections);
- concepts from geometry (equation of a plane and a line in three-dimensional space).

Next, the student learns to apply important concepts from vector calculus to problems from statics. To this end, he/she first acquires an introductory basic knowledge of Newtonian mechanics of a particle, of a system of particles, and of a rigid body. He/she becomes familiar with basic concepts of statics: force and torque; equilibrium conditions.
The student is introduced to strength of materials, more specifically the student learns to determine axial deformation and transverse contraction under the influence of normal stress while taking into account material properties.</td></tr>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
written exam</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
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<tr><td colspan="4">Second session
written exam</td></tr>
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<tr><td>Caesura measures</td><td>- Obtain a minimum of 8/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Mathematics</td></tr>
<tr><td>Additional information</td><td>- Spiegel, M. R. (1987). Theoretical mechanics: Schaum's outline of theory and problems. New York, NY: McGraw-Hill.
- Spiegel, M. R. (2002). Theory and problems of advanced calculus. New York, NY: McGraw-Hill.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MATHEMATICS AND PHYSICS (PART 1) (10 UC)**
Course element	**Waves** **(HZS-WE-TE-NW144)**
Lecturer(s)	**Katrijn VERHASSELT**
Lecturer in charge	Peter BUEKEN
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises			
Other teaching methods	Tutoring Demonstration			
Instruction language	Dutch/French			
Required preliminary credit(s)				
Units of credit (UC)	2			
Hours of formal lecture/practical exercise	12/6			
Semester + module(s)	Semester 1, Module 1.1 -/-	Semester 1, Module 1.2 -/-	**Semester 2, Module 2.1** **6/3**	**Semester 2, Module 2.2** **6/3**
Learning objectives	At the end of the course, the student is expected to be able to: - possess a theoretical understanding of what the phenomenon 'wave' implies, as of the classification of waves; - describe the general characteristics of wave phenomena using the harmonic wave; - understand how a suitable combination of (harmonic) waves creates beats and standing waves, and to carry out basic calculations in relation to this; - analyse Doppler shift for sonar and radar systems and determine the motions of source and observer; - understand and apply the principles of interference in a general and specific sense; - understand the importance of the decibel scale and to calculate sound levels and intensities correctly.			

<table>
<tr><td>Course content</td><td>The student learns to work in a theoretical and applied manner with wave phenomena and their characteristics:
- longitudinal and transversal waves;

- mechanical and electromagnetic waves;
- wave function and speed of propagation of a wave (celerity);
- power and intensity;
- beats;
- standing waves;
- Huygens’ principle;
- refraction and reflection;
- interference and diffraction;
- the Doppler effect for mechanical waves;
- the Decibel scale;
- total internal reflection;
- the Doppler effect for electromagnetic waves;
- the vector of Poynting.</td></tr>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
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-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Mathematics</td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**PSYCHOLOGY: HUMAN ASPECTS OF NAVIGATION (3 UC)**
Course element	**Psychology: human aspects of navigation (HZS-WE-HT-NW180)**
Lecturer(s)	**Camille DEBANDT**
Lecturer in charge	Camille DEBANDT
Educational programme	**First Year Bachelor in Nautical Sciences**

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 -/- | **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: - understand simple psychological processes, such as observation and attention, and evaluate their effect on the life on board; - understand the influence of social situations on human behaviour in order to demonstrate appropriate social skills during interpersonal contact; - understand and remember the qualities and pitfalls of different styles of conflict in order to be able to use the most appropriate style during a conflict and thus promote teamwork; - understand, with knowledge of the sleeping process, the principle of circadian rhythm and the disruptive effects of standing watch on sleep rhythm, as well asthe causes and prevention of fatigue; - identify symptoms of excessive personal stress and those of others.
Course content	The course introduces the basic principles of psychology and its research methods while examining, together with the student, the following themes: perception, attention and sleep/fatigue. The student furthermore becomes acquainted with topics from social psychology that are relevant to maritime navigation via group discussions and exercises regarding social influence, attribution, conformity, obedience, group decision-making, helping others (diffusing of responsibility), aggression, stereotypes, and stress.

<table>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
written exam</td><td>Following Module 2.2
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<tr><td colspan="4">Second session
written exam</td></tr>
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</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MARITIME ENGLISH - PART 1 (7 UC)**
Course element	**Maritime English - part 1 (HZS-WE-HT-NW110)**
Lecturer(s)	**Pieter DECANCQ, Felix HERMANS**
Lecturer in charge	Felix HERMANS
Educational programme	**First Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Portfolio
Instruction language	English
Required preliminary credit(s)	
Units of credit (UC)	7
Hours of formal lecture/practical exercise	36/24
Semester + module(s)	Semester 1, Module 1.1 -/- | **Semester 1, Module 1.2 12/12** | **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: - recognise, understand, remember, and use specific maritime vocabulary at the introductory level to communicate about a range of maritime topics; - understand, remember, and use English grammar at the repetitive level (secondary education) in general-maritime communication situations; - understand, analyse, and process specific maritime (both nautical and engineering) texts, listening and video files at the introductory level through reflective exercises, both oral and written; - use specific maritime reporting methods by writing a report relevant to either Nautical Sciences or Marine Engineering; - Recognise, understand, remember, and apply the maritime specific communication method known as *IMO Standard Marine Communication Phrases* at the introductory level.

<table>
<tr><td>Course content</td><td>In the study section Maritime English 1 the student learns to:
- use English to communicate about a range of maritime subjects relevant to both Nautical Sciences and Marine Engineering;

- competently use specific maritime vocabulary at an introductory level through the study in English of maritime texts;
- competently apply English grammar at the repetitive level (secondary education) in general grammar exercises, including at the spoken and written level;
- process original maritime documents by means of reflection, analysis, (spoken) commentary, and creative writing skills;
- understand and apply the specific maritime communication method IMO Standard Marine Communication Phrases at an introductory level through various gapfill, speaking and writing exercises.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2 permanent evaluation</td><td>Following Module 2.1 written and permanent evaluation</td><td>Following Module 2.2 oral exam and permanent evaluation</td></tr>
<tr><td colspan="4">Second session
oral and written exam en portfolio</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- 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.
- Logie, C. Nisbet, A. & Witcher Kutz, A. (1998). Marlins English for Seafarers, Study Pack 2. Edinburgh, UK: Marlins. ISBN 0953174816.
- 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.
- 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.
- No calculator allowed.</td></tr>
</table>

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. ISBN: 9789280142112.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MARITIME ENGLISH (REFRESHER COURSE) (UC)**
Course element	**Maritime English (refresher course) (HZS-WE-HT-NW112)**
Lecturer(s)	**Pieter DECANCQ**
Lecturer in charge	Pieter DECANCQ
Educational programme	**First Year Bachelor in Nautical Sciences**

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: - recognise, memorise, and use a starter pack of general maritime vocabulary in accordance with the General Maritime English (GME) section of the IMO Model Course 3.17 Maritime English 2015 edition; - remember, understand, and apply English grammar in general maritime English communication situations; - have a sufficient command of the reading, listening, writing, and speaking skills in the English language to serve as an introduction to the maritime English part of the course (part 1).
Course content	In the Refresher Course (optional refresher course with compulsory test at the end of the module) the student becomes acquainted with: - a starter pack of general maritime vocabulary using texts, audio and video files in accordance with the General Maritime English (GME) section of the IMO Model Course 3.17 Maritime English 2015 edition; - repetitive English grammar in general maritime reading, writing, listening and speaking exercises. The student follows this course to refresh his/her general knowledge of the English language and become acquainted with the English-speaking maritime world through a student-oriented and communicative approach.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
integrated practical test</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
-</td></tr>
<tr><td colspan="4">Second session
second session impossible</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Murphy, R. (2004). English Grammar in Use (4th ed.). Cambridge, UK: Cambridge University Press. ISBN 97811075339334.
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Proficiency in General English is recommended</td></tr>
<tr><td>Additional information</td><td>- International Maritime Organization. (2002). Standard Marine Communication Phrases. London, UK: IMO.
- International Maritime Organization. (2015). Model Course 3.17 Maritime English, 2015 version. London, UK: IMO.
- Logie, C., Vivers, E. & Nisbet, A. (1998). Marlins English for Seafarers Study Pack 1. Edinburgh, UK: Marlins. ISBN: 0953174808.
- Murphy, R. (1990). Essential Grammar in Use (3rd ed.). Cambridge, UK: Cambridge University Press. ISBN: 9780521675437.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 2) (11 UC)**
Course element	**Navigation (part 2)** **(HZS-NW-NAV-NW210)**
Lecturer(s)	**Marieke UTEN**
Lecturer in charge	Marieke UTEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Navigation (Part 1) Mathematics and Physics (Part 1)
Units of credit (UC)	4
Hours of formal lecture/practical exercise	24/24
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: - determine the geographical position of celestial bodies; - interpret and use the different coordinate systems; - apply the principles of time measurement; - determine his/her position using astronomical observations; - use the Nautical Almanac.
Course content	In 'Navigation (Part 2),' the student is presented with a revision of the principles covered in 'Navigation (Part 1)' in conjunction with celestial sphere, navigation triangle, and various coordinate systems. The different ways of time measurement are also discussed. By applying these principles, the student learns to determine his/her position at sea through astronomical observations in different ways: intercept, true noon, determination of longitude, Pagel's method, true latitude by means of Polaris. The student learns how to use the Nautical Almanac and Norie's Nautical Tables.
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)

<table>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Nautical Almanac. (latest ed.). Blue Lake, US: Paradise Cay Publications.
- Norie, J. W., Blance, G. (2007). Norie’s Nautical Tables: With an Explanation of Their Use. London, UK: Imray, Laurie, Norie & Wilson.
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Bowditch, LL.D. (2002). The American Practical Navigator, volume 1 & 2. US: Defense Mapping Agency Hydrographic Center.
- Case, J.(2011). Astro Navigation Demystified, Jack Case 2011-11-09. ISBN 0954133129
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.
- Moore, P. (2010). Patrick Moore’s Astronomy: Teach Yourself. London, UK: Hodder & Stoughton. ISBN-9781444129779.
- Prinet, D. F. (2017). Coastal Navigation: for Class and Home Study. Victoria, US: FriesenPress. ISBN9781525521232.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 2) (11 UC)**
Course element	**Chart work (part 2)** **(HZS-NW-NAV-NW220)**
Lecturer(s)	**Patricia VAN LANGENHOVEN**
Lecturer in charge	Marieke UTEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Navigation (Part 1) Mathematics and Physics (Part 1)
Units of credit (UC)	3
Hours of formal lecture/practical exercise	12/24
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 -/12**
Learning objectives	At the end of the course, the student is expected to be able to: -determine the position of the ship in coastal navigation by various methods; -calculate tidal heights and determine tidal windows using tide tables; -look up all the information necessary for the voyage in the various nautical publications (both paper and digital); -keep paper and digital nautical publications up to date; -possess insight in the preparation of a good passage plan for all circumstances.

<table>
<tr><td>Course content</td><td>In the first part of the course, the student acquires further knowledge of coastal navigation with insight into all relevant aspects. Emphasis is placed on:

- methods of position fixing;
- discussion and use of the main nautical publications (paper and digital);
- keeping nautical publications up to date (paper and digital);
- calculation of a tidal height and determination of a tidal window using tide tables;
- meteorological influences on the water level.

In part two the student receives an introduction to voyage planning, whereby the following topics are covered:

- international regulations;
- drawing up a good voyage plan;
- VTS procedures and Ship Reporting systems;
- UKC policy;
- specific planning in the Arctic;
- the use of voyage planning software with integrated electronic charts.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Parallel ruler and compass.
- British Admiralty. (2016). NP 5011, Symbols & Abbreviations used on Admiralty Charts. London, UK: United Kingdom Hydrographic Office.
- British Admiralty. (latest ed.). Chart 5055, Dover Strait. London, UK: United Kingdom Hydrographic Office.
- Hogere Zeevaartschool Antwerpen. HZS-Databook, Antwerpen, België: HZS.
- Norie, J. W., Blance, G. (2007). Norie’s Nautical Tables: With an Explanation of Their Use. London, UK: Imray, Laurie, Norie & Wilson.
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Chart Work (part 1)
On board training
Maritime English - part 1</td></tr>
</table>

Additional information	- Anwar, N. (2006). *Passage Planning Principles.* London, UK: Seamanship International. - Bowditch, LL.D. (2002). *The American Practical Navigator, volume 1 & 2.* US: Defense Mapping Agency Hydrographic Center. - British Admiralty. (2016). *NP 100, The Mariner's Handbook, (11th ed.).* London, UK: United Kingdom Hydrographic Office. - International Chamber of Shipping. (2016). *Bridge Procedures Guide,* (5th ed). London, UK: ICS. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - Squair, W.H. (1992). *Modern Chartwork.* Glasgow, UK: Brown, Son & Ferguson, Ltd.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 2) (11 UC)**
Course element	**Radar - part 1** **(HZS-NW-NAV-NW260)**
Lecturer(s)	**Denis STEVENS**
Lecturer in charge	Marieke UTEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French + English
Required preliminary credit(s)	**Standard succession (must have followed)** Navigation (Part 1) Mathematics and Physics (Part 1)
Units of credit (UC)	2
Hours of formal lecture/practical exercise	6/7.5
Semester + module(s)	Semester 1, Module 1.1 -/- | **Semester 1, Module 1.2 6/-** | Semester 2, Module 2.1 -/- | **Semester 2, Module 2.2 -/7.5**
Learning objectives	At the end of the course, the student is expected to be able to: - set the RADAR correctly (gain/tuning/range/vectors/heading/speed/clutter/interference/motion mode/PI/CPA/TCPA); - use the ARPA correctly (plotting); - interpret the limits and accuracy of the device; - interpret correctly the information obtained on the screen; - recognise (un)desired echoes; - determine the bearing and distance of objects; - determine a position.
Course content	The course covers the operation and use of a modern RADAR device. The ARPA is studied in depth. The RADAR/ARPA constitutes an important part of the navigation instruments on a ship's bridge. The student learns to set up the device and interpret the data correctly. The importance of safe navigation is emphasized, whereby the student is taught the role of the RADAR/ARPA in avoiding collisions and making position measurements.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
permanent evaluation</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Parallel ruler and compass.
- Plotting sheets.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Chart Work (part 1)</td></tr>
<tr><td>Additional information</td><td>- Bole, A., Wall, A., Norris, A. (latest ed.). Radar and ARPA Manual. Amsterdam, The Netherlands: Elsevier.
- Burger. (1983). Radar Observers Handbook for Merchant Navy Officers (7th ed.). Glasgow, UK: Brown, Son and Ferguson,
- Cockcroft A.N., Lameijer, J.N.F. (1996). A guide to the Collision Avoidance Rules, (5th ed.). Oxford, UK: Heinemann Professional Publishing.
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.
- Lownsborough, R., Calcutt, D. (1993). Electronic Aids to Navigation: Radar and ARPA. London, UK: Edward Arnold.
- Subramaniam, H. (latest ed.). Shipborne Radar. Mumbai, India: Vijaya Publications.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 2) (11 UC)**
Course element	**ECDIS (part 1)** **(HZS-NW-NAV-NW261)**
Lecturer(s)	**Inez HOUBEN**
Lecturer in charge	Marieke UTEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** Navigation (Part 1) Mathematics and Physics (Part 1)
Units of credit (UC)	2
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: -identify the difference between ECDIS and other ECS; -clarify the legislative system and performance requirements to be met by an ECDIS according to IMO and HEI; -deduce the transport and training requirements for ECDIS on board a ship; -clarify what an ECDIS onboard configuration entails, and what its main components are; -clarify what hydrographic data providers are, and how global data acquisition is achieved; -describe the principle of electronic data presentation on ECDIS; -understand and apply the essential operating principles (chart scales, chart content and data display, scamin, quality of the data, depth information settings, and navigational tools); -explain alarms and alarm management principles; -clarify voyage planning, route monitoring, and route management principles; -explain the working principles of AIS and understand AIS overlay and radar overlay in ECDIS; - explain how to keep ECDIS and electronic chart data up to date; -justify the dangers and issues associated with the use of ECDIS.

<table>
<tr><td>Course content</td><td>The student acquires a thorough theoretical knowledge of the navigational instrument ECDIS and its essential principles of use on board ships. The student is given insight into the legislative framework concerning ECDIS and the general working principles of the system such as data acquisition, data presentation, positioning, and the integration of other navigation instruments such as AIS and radar. In addition, the student learns more about operational use, including route planning and route monitoring, alarm management, and keeping ECDIS and chart data up to date. Finally, the student will gain insights into the possible dangers and risks associated with the use of ECDIS.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Bowditch, LL.D. (2002). The American Practical Navigator, volume 1 & 2. US: Defense Mapping Agency Hydrographic Center.
- 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.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**REGULATIONS OF MARITIME TRAFFIC (PART 2) AND MANOEUVRES (PART 1) (4 UC)**
Course element	**Regulations of maritime traffic (part 2) (HZS-NW-NAV-NW250)**
Lecturer(s)	**Christophe SENSEN**
Lecturer in charge	Christophe SENSEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Regulations of maritime traffic (Part 1)
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: - understand and explain the role of a good lookout, safe speed, and determine collision hazards; - classify all vessels in order to subsequently act in accordance with the appropriate collision rules, and manoeuvre with good seamanship; - track buoys/beacons correctly without endangering the vessel.
Course content	The student learns to apply the knowledge acquired in 1st bachelor and becomes acquainted with part A (rules 1 and 2) and part B (sections 1, 2 and 3) of the 'International Regulations for Preventing Collisions at Sea' (London, 1972), updated with the most recent amendments. The student acquires knowledge of the role of a good lookout, safe speed, and determining collision hazards. The student acquires knowledge about evasive manoeuvres in- and outside narrow waterways, traffic separation schemes, both in sight of each other as in restricted visibility.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module
1.1
-</td><td>Following Module
1.2
written exam</td><td>Following Module
2.1
-</td><td>Following Module
2.2
-</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- British Admiralty. (2018). NP735 IALA Maritime buoyage System, Combined Cardinal and Lateral System, as amended. London, UK: United Kingdom Hydrographic Office.
- International Maritime Organization. (2003). Colreg: Convention on the International Regulations for Preventing Collisions at Sea, as amended. London, UK: IMO.
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**REGULATIONS OF MARITIME TRAFFIC (PART 2) AND MANOEUVRES (PART 1) (4 UC)**
Course element	**Manoeuvres (part 1)** **(HZS-NW-NAV-NW204)**
Lecturer(s)	**Christophe SENSEN, Dries VAN ZUNDERT**
Lecturer in charge	Christophe SENSEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Regulations of maritime traffic (Part 1)
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: have thorough theoretical knowledge and insight with regard to the subject on: - the use of the propulsion and manoeuvring systems; - the effect of load capacity, draught, trim, speed, and keel clearance on turning circles and stopping distances; - the effect of wind and current on manoeuvring a ship; - Manoeuvres and procedures for rescuing a person who has fallen overboard; - squat, shallow water, and similar effects; - appropriate anchoring and mooring procedures.
Course content	The student acquires knowledge of and insight into all the factors that play a role in manoeuvring a ship. More specifically, this course covers the following subjects: the various propulsion possibilities, the influence of wind and current, anchoring, mooring, man overboard manoeuvres, and ship interaction.
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)

<table>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written and permanent evaluation</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Ship technique - theory</td></tr>
<tr><td>Additional information</td><td>- Baudu, H. (2014). Ship Handling. Enkhuisen, The Netherlands: Dokmar Maritime Publishers. ISBN 9799071500275.
- Hooyer, H. H. (2010). Behavior and handling of ships. Centerville, US: Cornell Maritime Press. ISBN: 0870333062.
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.
- Paffett, J. A. (1990). Ships and Water. Niwot. US: Seaways. ISBN 9781870077064.
- Rowe, R. W. (1996). The Shiphandler’s Guide for Masters and Navigating Officers. London, UK: The Nautical Institute. ISBN: 9781870077354.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SHIP TECHNIQUE (PART 2) (3 UC)**
Course element	**Ship technique - theory (HZS-NW-EXP-NW201)**
Lecturer(s)	**Ynse JANSSENS**
Lecturer in charge	Ynse JANSSENS
Educational programme	**Second Year Bachelor in Nautical Sciences**

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	36/-
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 -/-
Learning objectives	At the end of the course, the student is expected to be able to: - name the different types of cargo that ships can carry; - understand why cargoes need to be loaded and secured in a certain way; - describe how to make a particular cargo seaworthy; - describe how to make a ship ready for loading; - define problems with certain cargoes; - understand why certain cargoes can be hazardous.
Course content	In this second part of the course 'Ship Technique', emphasis is placed on the different types of cargo that ships carry. The student is given insight into breakbulk cargo, RORO's, offshore, bulk carriers, and tankers. Attention hereby is paid to the preparation of holds and tanks, loading and discharging operations, stowing and securing the cargo for sea, as well as monitoring the cargo during the loaded voyage.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
written exam</td><td>Following Module 2.2
-</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Ship technique (Part 1)</td></tr>
<tr><td>Additional information</td><td>- International Maritime Organization. (1974). International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended. London, UK: IMO.
- International Maritime Organization. (latest ed.). Code of Safe Practice for cargo stowage and securing. London, UK: IMO.
- International Maritime Organization. (latest ed.). International Code for the safe carriage of grain in bulk. London, UK: IMO.
- International Maritime Organization. (latest ed.). International Maritime Dangerous Goods Code (IMDG). London, UK: IMO.
- International Maritime Organization. (latest ed.). International Maritime Solid Bulk Cargo Code (IMSBC-code). London, UK: IMO.
- Isbester, J. (2003). Bulk Carrier Practice. London, UK:The Nautical Institute. ISBN: 1870077164.
- van Dokkum, K. (latest ed.). Ship Knowledge. Enkhuizen, The Netherlands: Dokmar.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**SHIP TECHNIQUE (PART 2) (3 UC)**
Course element	**Ship technique (part 2) - exercises (HZS-NW-EXP-NW202)**
Lecturer(s)	**Raf MESKENS**
Lecturer in charge	Ynse JANSSENS
Educational programme	**Second Year Bachelor in Nautical Sciences**

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 -/- | Semester 1, Module 1.2 -/- | **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: - understand the importance of paint on board a ship; - properly prepare a steel surface; - use the correct materials and techniques to prepare the surface for painting; - choose the right paint for the planned maintenance; - paint as fit and appropriate; - clean and store all materials correctly; and all this in a safe and correct manner, with respect for the environment.
Course content	In 'ship technique (part 2) – exercises' the student is given theoretical and practical instruction about the importance of paint on board a ship, with reference to and explanation of the PSPC15 legislation. The theoretical part explores the importance of paint as a protection against corrosion, applied during the construction of the ship and with the crew playing a key role in the planned maintenance during the ship's economic lifecycle. Also explained are the types of paints and their function on board ships, the composition and classification of paints at a very basic level, as well as the practical application of onboard painting. In the practical part, the student is given the opportunity to prepare a steel surface, clean it as fit and appropriate, prepare paint and apply it in accordance with standard procedures. In the second part of the course, a practical elaboration of a draught survey will be explained in class.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr><tr><td colspan="4">Second session
oral exam with written preparation</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Safety clothing.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SAFETY TECHNOLOGY (PART 2) (5 UC)**
Course element	**ISM** **(HZS-NW-EXP-NW212)**
Lecturer(s)	**Marieke UTEN**
Lecturer in charge	Marieke UTEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

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	18/-
Semester + module(s)	Semester 1, Module 1.1 -/- **Semester 1, Module 1.2** **18/-** 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: - know and apply the basic principles and regulations of the ISM and code; - Identify, ensure, and evaluate the requirements of a safety management system; - Perform risk analysis techniques for safety.
Course content	In a first phase the student becomes acquainted with the background and origin of the ISM code. Secondly, the student discovers the structure of both codes and becomes acquainted with the administrative and practical requirements prescribed by the code. Accordingly, the student delves into the various risk analysis techniques and requirements of safety management systems.
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)

Examination	Following Module 1.1 -	**Following Module 1.2** **written exam**	Following Module 2.1 -	Following Module 2.2 -
	Second session **written exam**			
Caesura measures				
Required study material	- Lecturer's course text available. - International Maritime Organization. (latest ed.). *International Safety Management Code (ISM).* London, UK: IMO. - No calculator allowed.			
Recommended preliminary competences				
Additional information				

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**SAFETY TECHNOLOGY (PART 2) (5 UC)**
Course element	**Search & Rescue (SAR)** **(HZS-NW-EXP-NW207)**
Lecturer(s)	**Anne-Pascale MORNARD**
Lecturer in charge	Marieke UTEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	Excursion
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** **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: - know the content and objectives of IAMSAR; - understand and apply the procedures described in IAMSAR; - know the responsibilities and limitations of the SAR coordinators; - understand drift determination and thus the determination of the reference point for a search operation; - know and understand the procedures of a medical evacuation; - know SAR-related communication; - apply and correctly interpret search action messages.
Course content	This course provides in-depth knowledge of IAMSAR with an emphasis on an understanding of assistance and coordination by mobile search and rescue units, as well as knowledge of aspects of SAR related to personal emergencies. The student will acquire knowledge of the matter by means of examples and research assignments.

<table>
<tr><td>Learning outcomes</td><td>- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1</td><td>Following Module 2.2</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- British Admiralty. (latest ed.). Admiralty list of Radio Signals. London, UK: United Kingdom Hydrographic Office.
- International Maritime Organization. (latest ed.). IAMSAR manual, volume 2. London, UK: IMO. ISBN: 9789280116403.
- International Maritime Organization. (latest ed.). IAMSAR manual, volume 1. London, UK: IMO. ISBN: 9789280116397.
- International Maritime Organization. (latest ed.). IAMSAR manual, volume 3. London, UK: IMO. ISBN: 9789280116410.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**SAFETY TECHNOLOGY (PART 2) (5 UC)**
Course element	**ISPS** **(HZS-NW-EXP-NW205)**
Lecturer(s)	**Frederik BOUMANS**
Lecturer in charge	Marieke UTEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
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: - demonstrate and apply the principles and regulations of the ISPS and PFSO codes; - identify, ensure, and evaluate the requirements of a ship security plan; - identify, ensure, and evaluate the requirements of a port facility security plan; - carry out risk analysis techniques concerning safety and security;

<table>
<tr><td>Course content</td><td>The student first studies the background and origin of the ISPS and PFSO codes. Secondly, the student explores the structure of these codes and becomes familiar with the administrative and practical requirements prescribed by them. The student delves into various risk analysis techniques and the requirements of security management systems.</td></tr>
<tr><td>Learning outcomes</td><td></td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module
1.1
-</td><td>Following Module
1.2
-</td><td>Following Module
2.1
-</td><td>Following Module
2.2
written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- International Maritime Organization. (latest ed.). International Ship and Port Facility Security Code (ISPS). London, UK: IMO.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**STABILITY (PART 2) (3 UC)**
Course element	**Stability (part 2)** **(HZS-NW-NAV-NW206)**
Lecturer(s)	**Ynse JANSSENS**
Lecturer in charge	Ynse JANSSENS
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Stability (Part 1)
Units of credit (UC)	3
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: - perform approximate calculations of surfaces and volumes using Simpson's rules; - perform and assess stability calculations for moderate and large angles of heel; - calculate trim and list for various practical problems; - understand, calculate, and apply the effect of water density on vessel draughts; - understand, calculate, and apply the effect of free fluid surfaces on ship stability.
Course content	Following the initial stability taught in the first part, the second part of the 'stability' trajectory first examines the transverse stability at larger angle of heel. The student also learns how to calculate the hydrostatic data from the ship's plans. This is done by means of approximate calculations of surfaces and volumes, Simpson’s rules. Afterwards, the student studies longitudinal stability in a classroom context, with the aim of learning to solve practical draught problems. The influence of the water density on the ship's draughts is also taken into account. In the final part the student becomes acquainted with the importance and influence of free fluid surfaces on the transverse stability.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
written exam</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
-</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Rhodes, M. (latest ed.). Ship Stability strength and loading principles, Witherby Seamanship International Ltd. ISBN : 9781856099448
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- 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. (latest ed.). International Code on Intact Stability. London, UK: IMO.
- Rhodes, M. (2009). Ship Stability OOW. Edinburgh: Witherby Seamanship International Ltd. ISBN 9781905331642.
- van Dokkum, K. (latest ed.). Ship Stability. Enkhuizen, The Netherlands: Dokmar.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**ELECTRONICS (PART 1) (4 UC)**
Course element	**Electronics (part 1) - theory (HZS-WE-TE-NW212T)**
Lecturer(s)	**Tim GEERTS**
Lecturer in charge	Tim GEERTS
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Theory of electricity
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: - make an analysis of simple electronic circuits; - recognise (semi-)conductor components in electronic schematics and assess what they are needed for; - have a thorough understanding of (AC) current, voltage, and impedance; - establish the difference between an analysis in the time domain and the frequency domain.
Course content	The student acquires a basic knowledge of electronics. For this the student can rely on the Electricity courses 1 & 2. He/she is given an overview of a number of semiconductor components and their applications. The student solves problems relating to alternating currents and voltages by means of phasors and impedances.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following
Module 1.1
-</td><td>Following
Module 1.2
-</td><td>Following
Module 2.1
-</td><td>Following Module 2.2
oral exam with written preparation</td></tr><tr><td colspan="4">Second session
oral exam with written preparation</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Integral calculus (part 2) and statistical methods for scientific research</td></tr>
<tr><td>Additional information</td><td>- IMO International Convention on Standards of Training, Certification and Watchkeeping (STCW) 1978, as amended. (1978). International Maritime Organization, London.
- Horowitz, P., Winfield, H. (2015). The Art of Electronics, 3rd Revised Edition. New York, United States: Cambridge University Press. ISBN 0521809266.
- Schuler, C. (2018). Electronics: Principles and Applications. United States : McGraw-Hill Education. ISBN 0073373834.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**ELECTRONICS (PART 1) (4 UC)**
Course element	**Electronics (part 1) - exercises (HZS-WE-TE-NW213T)**
Lecturer(s)	**Tim COOLS, Tim GEERTS**
Lecturer in charge	Tim GEERTS
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Theory of electricity
Units of credit (UC)	1
Hours of formal lecture/practical exercise	-/18
Semester + module(s)	Semester 1, Module 1.1 -/- | Semester 1, Module 1.2 -/- | **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: - measure a voltage in a circuit using a measuring device (both AC and DC); - measure a current in a circuit by means of a measuring device (both AC and DC); - estimate the hazard that may exist when taking a measurement; - use the devices in the lab; - build up an electronic circuit on a test board using the scheme provided; - draw up a set of characteristics on the basis of measurement results.
Course content	The student becomes acquainted with a number of measuring devices that have already been discusses in practical sessions: multimeter, function generator, direct voltage source, oscilloscope. By means of practical exercises, the student will apply what he/she has learned in the Electricity courses 1 and 2, and Electronics (Part 1) – Theory'. Examples of the electronic circuits the student will deal with are: resonant circuits, rectification of alternating current, amplifiers with transistors, and operational amplifiers.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
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-</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr>
<tr><td colspan="4">Second session
oral exam with written preparation</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Integral calculus (part 2) and statistical methods for scientific research</td></tr>
<tr><td>Additional information</td><td>- Horowitz, P., Winfield, H. (2015). The Art of Electronics, 3rd Revised Edition. New York, US: Cambridge University Press. ISBN 0521809266.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**THERMODYNAMICS & SHIP'S CONSTRUCTION (PART 2) (3 UC)**
Course element	**Thermodynamics (HZS-WE-TE-NW211T)**
Lecturer(s)	**Marc VERVOORT**
Lecturer in charge	Marc VERVOORT/Remke WILLEMEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Ship's construction - part 1 Mathematics and Physics (Part 1)
Units of credit (UC)	2
Hours of formal lecture/practical exercise	15/-
Semester + module(s)	**Semester 1, Module 1.1** **12/-** **Semester 1, Module 1.2** **3/-** 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: - apply the first main law of thermodynamics to closed systems (specifically to transformations of perfect gases) and to open systems; - demonstrate the use of state and other variables in transformation exercises; - illustrate the second law of thermodynamics with various processes such as heat transfer and the refrigerator; - interpret the work and ability to construct a steam cycle and a cooling cycle; - use thermodynamic tables and graphs to interpret the two main laws on steam and refrigerating liquids; - illustrate the use of a psychrometric chart for the operation of an air conditioning system

<table>
<tr><td>Course content</td><td>Based on the theory of technical thermodynamics, students acquire a basic understanding of how machines and auxiliary equipment work. To begin with, students are introduced to state variables and other variables. They will see how the first law of thermodynamics is applied to closed systems (in general and more specifically to transformations of ideal gases) and to open systems (including application to the most common machines). The second law of thermodynamics is illustrated with various processes such as heat transfer with the steam cycle and the refrigeration machine with the refrigeration cycle.

Students learn how these two main laws are applied to steam and coolants, with an emphasis on the use of thermodynamic tables and graphs.

As detailed applications, students study the refrigeration machine, as well as some examples of installations for liquefying gas and air conditioning installations.</td></tr>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module
1.1
-</td><td>Following Module
1.2
written exam</td><td>Following Module
2.1
-</td><td>Following Module
2.2
-</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Integral calculus (part 2) and statistical methods for scientific research</td></tr>
<tr><td>Additional information</td><td>- IMO Model Course 7.04: Marine Engineering at the Management Level
- International Maritime Organization. (2014). Model course 1.01: Basic training for oil and chemical tanker cargo operations. London, UK: IMO.
- International Maritime Organization. (2014). Model course 1.06: Specialized training for liquefied gas tankers. London, UK: IMO.
- International Maritime Organization. (2014). Model course 7.03: Officer in charge of a navigational watch. London, UK: IMO.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**THERMODYNAMICS & SHIP'S CONSTRUCTION (PART 2) (3 UC)**
Course element	**Ship's construction (part 2)** **(HZS-WE-TE-NW214T)**
Lecturer(s)	**Remke WILLEMEN**
Lecturer in charge	Marc VERVOORT/Remke WILLEMEN
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** Ship's construction - part 1 Mathematics and Physics (Part 1)
Units of credit (UC)	1
Hours of formal lecture/practical exercise	10/-
Semester + module(s)	Semester 1, Module 1.1 -/- | Semester 1, Module 1.2 -/- | **Semester 2, Module 2.1 10/-** | Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to: - calculate and evaluate shear forces and bending moments; - draw diagrams of shear forces and bending moments of beam structures and simple ship hulls; - investigate and evaluate the relationship between stress and shear forces and bending moments; - have theoretical knowledge of the resistance of a ship in relation to propulsion and speed; - be able to motivate a required engine power.
Course content	In the first part of the course, simple beam bending problems are analysed, after which the student is able to draw diagrams of shear forces and bending moments. After mastering the theoretical principles of calculating shear forces and bending moments, box-shaped ship structures are analysed. Finally, the student learns how shear forces and bending moments are linked to stresses, on which are linked in turn to the possibility of failure. The knowledge of stresses is then applied on a simplified midship-section. In the second part, the student studies the ship's resistance by analysing all components of the total hull resistance. Subsequently, the principles of the towing tank are explained, including the modelling of a ship. The effective horsepower is then linked to the resistance leading to the required engine power.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
written exam</td><td>Following Module 2.2
-</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Clarck, I.C. (2008). Stability, trim and strength for merchant ships and fishing vessels. London, UK: The Nautical Institute. ISBN: 1870077873.
- Gere, J.M. & Timoshenko, S.P. (1998). Mechanics of Materials. London, UK: Stanley Thornes Publishers. ISBN: 0748740848.
- van Dokkum, K. (latest ed.). Ship Knowledge. Enkhuizen, The Netherlands: Dokmar.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**BUSINESS ECONOMICS (3 UC)**
Course element	**Business economics (HZS-WE-HT-NW210)**
Lecturer(s)	**Kateryna GRUSHEVSKA**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Second Year Bachelor in Nautical Sciences**

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: - impute basic accounting operations; - draw up a simple profit and loss account and balance sheet; - calculate financial ratios; - sum up and understand the various stages of drawing up a budget; - carry out a simple budgetary control; - distinguish between direct and indirect costs and allocate them to a product or service; - make a simple cost calculation; - analyse and critically evaluate a cost calculation; - calculate and compare the profitability of different investments using different methods; - list and understand the different costs of inventory management; - calculate the optimal order quantity.
Course content	Through exercises, the student becomes acquainted with double-entry bookkeeping. He/she analyses the balance sheet and profit-and-loss account of an existing shipping company and learns to draw up and evaluate a budget. The student produces a cost calculation of a product and/or service. He/she analyses and critically evaluates the cost price calculation. The student evaluates investments using various financial methods and acquires insight into stock management.

<table>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
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<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**GENERAL INTRODUCTION TO LAW (3 UC)**
Course element	**General introduction to law (HZS-WE-HT-NW260)**
Lecturer(s)	**Ralph DE WIT**
Lecturer in charge	Ralph DE WIT
Educational programme	**Second Year Bachelor in Nautical Sciences**

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: - understand the elementary concepts of the Belgian legal order (structure and content); - have an elementary knowledge of Belgian and international legal sources; - understand the basic rules of the most important branches of the law; - apply these basic rules to simple cases; - analyse and assess information from a legal perspective.

<table>
<tr><td>Course content</td><td>The course “Introduction to Law” aims to give students a first introduction to the law in all its facets. Given its limited size and its non-legally trained target audience, the course aims to provide a thematic overview of the various branches of the law.
The course consists of three parts: general concepts, an overview of public law and an overview of private law.
In the general introduction, some philosophical, ethical and historical aspects of the law are provided, and the general systematics are highlighted. The public law section provides an overview of Belgian constitutional law and the functioning of the Belgian state as a federation.
Furthermore, classic branches of public law are concisely situated: criminal law, tax law, international law (important for the later course “Law of the Sea”). Attention is also devoted to the Belgian judicial organisation.
The private law part mainly deals with classic civil law, with emphasis on the law of property and the law of obligations (both important for the later course “Maritime Law”), and the law of intellectual property.
The set-up is pragmatic and aims to familiarise the student as an intellectual and as a citizen with the Belgian political and judicial institutions, and with private law concepts with which every citizen is confronted.</td></tr>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
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<tr><td colspan="4">Second session
written exam</td></tr>
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</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MATHEMATICS AND PHYSICS (PART 2) (7 UC)**
Course element	**Integral calculus (part 2) and statistical methods for scientific research (HZS-WE-TE-NW243)**
Lecturer(s)	**Peter BUEKEN, Jonas JOOS, Deirdre LUYCKX**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Mathematics and Physics (Part 1)
Units of credit (UC)	2
Hours of formal lecture/practical exercise	18/6
Semester + module(s)	**Semester 1, Module 1.1** **18/6** | 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: - solve first- and second-order differential equations using the techniques discussed in the course; - determine double integrals and Fourier series of given functions, and interpret these correctly; - choose the appropriate technique for solving singular mathematical problems; - analysing and solving simple composite problems by dividing them into a series of successive sub-problems, identifying or collecting the necessary data, and carrying out the required operations in the order provided and using the appropriate calculation technique; - apply the techniques of descriptive statistics and statistical inference to concrete data sets, interpret the results and summarise them in a scientifically sound manner, both graphically and in text.

<table>
<tr><td>Course content</td><td>The student studies more advanced methods from integral calculus. He/she learns how to fluently handle multiple integrals, first- and second-order differential equations, Laplace transformations and Fourier sequences. He/she practises these principles and methods sufficiently to be able to apply them in other scientific subjects.

In addition, the student receives an introduction to statistics. He/she refreshes basic knowledge from descriptive statistics (graphical representation, measures of central tendency and of dispersion, normal distribution) and is introduced to the simplest principles of statistical inference (confidence interval and hypothesis testing for the population mean). The student learns to use these methods correctly, to interpret the results, and to report on them when analysing concrete data sets.</td></tr>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam met integrated practical test</td><td>Following Module 2.1
-</td><td>Following Module 2.2
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<tr><td colspan="4">Second session
written exam met integrated practical test</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Ayres, F., & Mendelson, E. (2013). Schaum’s outlines calculus. Schaum’s outline series (6th ed.). New York, NY: McGraw-Hill.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MATHEMATICS AND PHYSICS (PART 2) (7 UC)**
Course element	**Vector calculus - part 2 and dynamics (HZS-WE-TE-NW244)**
Lecturer(s)	**Peter BUEKEN, Jonas JOOS, Deirdre LUYCKX**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Mathematics and Physics (Part 1)
Units of credit (UC)	3
Hours of formal lecture/practical exercise	24/12
Semester + module(s)	**Semester 1, Module 1.1 6/3** | **Semester 1, Module 1.2 6/3** | **Semester 2, Module 2.1 6/3** | **Semester 2, Module 2.2 6/3**
Learning objectives	At the end of the course, the student is expected to be able to: - calculate the gradient, divergence, and rotation of a function or vector field, and interpret these concepts correctly; - calculate line integrals of vector fields in different ways, and interpret these line integrals as work - divide composite physical problems into sub-problems and solve them by selecting the appropriate method from the basic principles of Newtonian mechanics for the movement of point particles and for the plane rotation of rigid bodies; - approach physical problems both from the laws of Newton and from the work-energy-principle; - understand the effect of a damping force and/or an external source of vibration on a spring-mass system and to calculate the position of the mass as a function of time in these cases; - understand and explain physical phenomena (such as resonance, the Coriolis force, the gyroscope, ...) and their importance for navigation.

<table>
<tr><td>Course content</td><td>The student studies further the definition and geometric interpretation of vector-valued functions, the derivative of a vector-valued function and its geometric interpretation, the tangent line to a curve. In addition, he/she learns the relationship between this theory and its applications in dynamics by correctly defining the concepts of velocity and acceleration, curvature and arc length.

He/she extends the differential calculus to vector-valued functions and learns to work with directional derivative and gradient of a function of several variables, with vector fields and their divergence and rotation. The student also extends the integral calculus to vector-valued functions by becoming acquainted with line integrals (definition and calculation), integral of a vector field along a curve, work, Green’s theorem, conservative vector fields and their potential function.

The student learns the relationship between the theory of vector-valued functions and its applications in dynamics, by correctly defining the concepts of velocity and acceleration, curvature and arc length. He/she acquires further insight into the principles of Newtonian mechanics: kinematics and dynamics of a point particle, of a system of point particles and of a rigid body. He/she learns to break down and solve composite problems related to work and mechanical energy, to the most important types of forces in dynamics (terrestrial gravity, the restoring force of a spring, dry friction). He/she becomes acquainted with the concepts of impulse and linear momentum and their importance in collision problems of two point particles. He/she then applies the mathematical theory of differential equations to questions of free, damped and/or forced oscillations in order to learn to assess their importance on board a ship. The student learns concepts from rotational dynamics, such as angular momentum, torque and moment of inertia, and applies these concepts to problems of plane rotation and gyroscopic motion. He/she studies the dynamics behind the Coriolis force and the centrifugal force resulting from the rotation of the earth around its axis.</td></tr>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
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written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
</table>

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, NJ; Singapore: Pearson. - Hibbeler, R. C., Fan, S. C., Lefeber, D., van Overmeire, M., & Sol, H. (2011). Dynamica. Amsterdam, Nederland: Pearson Education Benelux. - Spiegel, M. R. (1967). *Schaum's Theory and Problems of Theoretical Mechanics*. New York, NY: McGraw-Hill. - Wrede, R. C., & Spiegel, M. R. (2010). *Schaum's outline of advanced calculus*. Schaum's outline series (3rd ed.). New York, NY: McGraw-Hill.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MATHEMATICS AND PHYSICS (PART 2) (7 UC)**
Course element	**Hydromechanics (HZS-WE-TE-NW240)**
Lecturer(s)	**Katrijn VERHASSELT**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Tutoring Demonstration
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Mathematics and Physics (Part 1)
Units of credit (UC)	2
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** **12/6** **Semester 2, Module 2.2** **6/6**
Learning objectives	At the end of the course, the student is expected to be able to: - understand the basic equation of hydrostatics; - apply this equation to the determination of hydrostatic pressure in stationary liquids and liquids in relative equilibrium; - determine the resulting force on plane and curved surfaces on the basis of the basic equation of hydrostatics, to understand the relation between these resulting forces and the Archimedes upthrust, and to determine the Archimedes force in the various cases of translational equilibrium; - understand the fundamental concepts and laws of hydrodynamics and their practical applications; - apply these laws to stationary flow through networks formed by reservoirs, pipes, fittings, pumps, and turbines; - understand and apply the principles of the resistance and lift forces on immersed bodies.
Course content	The student is introduced to the basic principles of hydrostatics: hydrostatic pressure, resulting hydrostatic pressure force on both plane and curved surfaces, centre of pressure, Archimedes' law, liquids at relative equilibrium. He/she will also study the basic principles of hydrodynamics: Bernoulli's equation for both ideal and real fluids, 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, the so-called boundary layer and forces on immersed bodies. The student acquires knowledge in the domain of physics, insights and skills to support other subjects and assist in the creation of a thesis.

<table>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr>
<tr><td colspan="4">Second session
written exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**CHEMISTRY (5 UC)**
Course element	**Chemistry - theory & Chemistry - practice (HZS-WE-TE-NW251 HZS-WE-TE-NW252)**
Lecturer(s)	**Joeri HORVATH Joeri HORVATH, Marc VERVOORT**
Lecturer in charge	Joeri HORVATH
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture Practical exercises
Other teaching methods	Demonstration
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	3
Hours of formal lecture/practical exercise	24/9
Semester + module(s)	**Semester 1, Module 1.1 6/-** | **Semester 1, Module 1.2 6/3** | **Semester 2, Module 2.1 -/3** | **Semester 2, Module 2.2 12/3**
Learning objectives	At the end of the course, the student is expected to be able to: - describe and classify different states of aggregation of the material and explain its properties; - describe the general structure of atoms and molecules; - use Mendeleev's Table to find data on atoms and thereby explain the properties of elements; - use the language of the chemical reaction equation and solve simple stoichiometric problems, including in the gas phase; - perform thermochemical calculations; - perform calculations on the strength of acids and bases and explain the behaviour of these substances using the theory of equilibrium reactions; - calculate simple electrochemical concepts; - explain the formation of corrosion and the main defence systems against it; - use the language of the chemical reaction equation and solve simple stoichiometric problems, including in the gas phase; - search for and interpret information on hazardous gases and acids; - safely carry out a simple chemical experiment.

<table>
<tr><td>Course content</td><td>At the beginning of this course the student learns to name and use the fundamental concepts of general chemistry, together with basic concepts of physics, to understand the behaviour of more complex materials. The student practises the correct use of the language of chemical reaction equation and solves simple stoichiometric problems, including in the gas phase and for ionic reactions. Combustion of fuels bridges the gap to the courses in Thermodynamics: the student applies the concepts of enthalpy, entropy and Gibbs' free energy to combustion reactions and related reactions. The student then examines the concept of equilibrium reactions and applies their general theory to describe and explain acid-base reactions and redox reactions. Finally, the student applies the concepts under scrutiny to understand corrosion as a maritime phenomenon and the measures to combat it.

Furthermore, the student becomes acquainted with the different classes of inorganic substances, learns to correctly name the different molecules and their properties. In doing so, the student also pays attention to safety and environmental aspects of various examples.

In the chemistry lab, the student learns how to handle dangerous acids and gases safely. He/she uses reference works to look up the properties of substances in order to correctly assess the dangers. Finally, the student continues to practise the calculation methods from the theory course.</td></tr>
<tr><td>Learning outcomes</td><td>- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following
Module 1.1
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Module 1.2
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Module 2.1
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oral exam with written preparation</td></tr>
<tr><td colspan="4">Second session
oral exam with written preparation</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
</table>

Additional information	- Goldberg, D. E. (1988). *3000 solved problems in chemistry*. Schaum's solved problems series. New York, NY: McGraw-Hill. - Goldberg, D. E., & Cullen, K. E. (2003). *Beginning chemistry*. Schaum's Easy Outlines. New York, NY: McGraw-Hill. - Groysman, A. (2009). *Corrosion for everybody*. Dordrecht, Netherlands: Springer. - Lewis, R.J. (2001). *Hawley's Condensed Chemical Dictionary* (14th ed.). New York, NY: John Wiley & Sons. - Rosenberg, J.L., Epstein, L.M., & Krieger, P.J. (2003). *College Chemistry*. Schaum's outline series. New York, NY: McGraw-Hill Education. - Samson Chemical Publishers. (1991). *Chemical Safety Sheets: Working safely with hazardous chemicals*. Dordrecht, Netherlands: Kluwer Academic Publishers.

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**CHEMISTRY (5 UC)**
Course element	**Hazardous products for man and environment (HZS-WE-TE-NW253)**
Lecturer(s)	**Joeri HORVATH, Marc VERVOORT**
Lecturer in charge	Joeri HORVATH
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	2
Hours of formal lecture/practical exercise	12/3
Semester + module(s)	Semester 1, Module 1.1 -/- | Semester 1, Module 1.2 -/- | **Semester 2, Module 2.1 12/-** | **Semester 2, Module 2.2 -/3**
Learning objectives	At the end of the course, the student is expected to be able to: - explain the meaning of the IMDG Code and correctly interpret the regulations in question; - identify the risks of hazardous substances through specific literature; - derive the required segregation of hazardous substances on board from the properties and regulations in the IMDG Code; - identify the most common hazardous substances and their properties.
Course content	In this course, the student is introduced to the International Maritime Dangerous Goods (IMDG) Code, the maritime regulations concerning the handling and transport of dangerous goods. After a general introduction on the scope of the IMDG Code, the student learns to classify hazardous substances and derive the risks of the substances from their description (in the IMDG Code itself and in Safety Data Sheets). The student then applies the regulations in the Code on stowage and segregation of dangerous goods on board a ship. During the practical sessions, the student practises using the IMDG Code and various Safety Data Sheets to look up the properties of dangerous goods and to determine the required segregation of cargo on this basis. The course ends with a lesson on the detection of dangerous gases and the use of personal protective equipment.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
oral exam with written preparation</td></tr><tr><td colspan="4">Second session
oral exam with written preparation</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- 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. (1991). Chemical Safety Sheets: Working safely with hazardous chemicals. Dordrecht, Nederland: Kluwer Academic Publishers.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MARITIME ENGLISH - PART 2 (4 UC)**
Course element	**Maritime English - part 2 (HZS-WE-HT-NW220)**
Lecturer(s)	**Felix HERMANS**
Lecturer in charge	Felix HERMANS
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Portfolio Group work
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** 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** **-/12** **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: - recognise, understand, remember, and use specific maritime vocabulary at a broader level in general maritime communication situations; - understand, remember, and use English grammar at a broader level in general-maritime communication situations; - be able to understand, analyse and process specific maritime texts, listening and video files at a broader level through reflective exercises - both written and through an oral (group) presentation; - to document an incident at sea (fire on board) in writing and present it orally, with witness report; - to recognise, understand, and use the specific terminology of Incoterms and logistical documents; - to recognise, understand, remember, and apply the IMO's Standard Marine Communication Phrases at a broader level (focus on SMCP Part B, repetition SMCP Part A).

<table>
<tr><td>Course content</td><td>In the Maritime English 2 course the student learns:

- to use specific maritime vocabulary at an elaborate level using specific maritime texts, audio and video files, as well as the course documents - with particular emphasis on, among other things, ship components, technical maritime vocabulary and maritime commercial concepts;
- to give an oral (group) presentation at a broader level on an incident at sea (fire on board) and quote scientific sources by writing a documented ‘Fire Report’;
- to apply English grammar at an elaborate level in general grammar exercises, various speaking and writing exercises, and simulations of specific maritime or logistical documents;
- to recognise, understand, and handle the conventions of maritime correspondence - including the adequate language register to be used;
- master the IMO Standard Marine Communication Phrases at a broader level (focus on SMCP Part B, repetition of SMCP Part A) through various gapfill, speaking, and writing exercises.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
written and permanent evaluation</td><td>Following Module 2.2
oral exam</td></tr>
<tr><td colspan="4">Second session
oral and written exam en portfolio</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- 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.
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
</table>

Additional information	- Blakey, T.N. (2001). English for Maritime Studies (2nd ed.). Upper Saddle River, US: Prentice Hall International Ltd. - Logie, C., Vivers, E. & Nisbet, A. (1998). *Marlins English for Seafarers, Study Pack 2*. Edinburgh, UK: Marlins. ISBN: 0953174816. - MarEng partner consortium. (2007). *MarEng Web-based Maritime English Learning Tool.* https://www.utu.fi . - MarEng Plus partner consortium. (2011). *MarEng Plus Web-based Maritime English Learning Tool.* https://www.utu.fi . - Nisbet, A., Whitcher Kutz, A. & Logie, C. (1997). *Marlins English for Seafarers Study Pack 1*. Edinburgh, UK: Marlins. ISBN: 0953174808. - Van Kluijven, P.C. (2003). *The International Maritime Language Programme* (7th ed.). Alkmaar, Netherlands: Alk & Heijnen Publishers. ISBN 9789059610064. - Weeks, F., Glover, A., Johnson, E., Strevens, P., (1988). *Seaspeak Training Manual*, *Essential English for International Maritime Use*. Plymouth, U.K.: Pergamon Press. ISBN 9780080315553.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MARITIME MEDICINE (PART 1) (5 UC)**
Course element	**Maritime medicine (part 1)** **(HZS-WE-HT-NW240)**
Lecturer(s)	**Thomas VAN LOOY**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Second Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	5
Hours of formal lecture/practical exercise	30/12
Semester + module(s)	Semester 1, Module 1.1 -/- **Semester 1, Module 1.2** **6/-** **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: - reproduce in an accurate and insightful manner the knowledge and skills offered in the study material and during the lessons, practice, and demonstrations; - demonstrate and apply the knowledge and skills acquired in relation to general pathology in a professional environment; - demonstrate and apply in a professional environment the knowledge and skills acquired with regard to occupational pathology and prevention; - provide on-board medical assistance in emergency situations in accordance with the criteria set out in the STCW95 Code as amended.
Course content	The student is introduced to the following topics: - First aid in case of accidents, at helper level. Special attention to wound care, fractures, bleeding, burns, drowning, CPR, and shock. - General pathology: introduction to the human body, diseases of the respiratory system, diseases of the cardiovascular system, diseases of the abdomen, sexually transmitted diseases, back problems, seasickness, malaria and quarantinable diseases, mental problems. - Occupational pathology and prevention: physical and chemical risks on board, drugs and alcohol, vaccinations, nutrition, and hygiene. - Use of the ship's pharmacy and radio medical advice. Through lessons, practice, and demonstrations, the student acquires the knowledge he/she needs to provide medical assistance on board in accordance with the criteria laid down in the STCW95 Code as amended.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)
- Produce a well-documented written report about the research project which meets all the formal requirements of an academic publication and which is correct in terms of language and style. (BA-NW-11)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
oral exam with written preparation en oral exam and permanent evaluation</td></tr>
<tr><td colspan="4">Second session
oral exam with written preparation en oral exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Marine and Coastguard Agency. (latest ed.). The ship captain’s medical guide. London, UK: The Stationery Office.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 3) (8 UC)**
Course element	**Navigation (part 3)** **(HZS-NW-NAV-NW310)**
Lecturer(s)	**Klaas DE HERT, Laura DE WEL**
Lecturer in charge	Veerle VAN DRIESSCHE
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Group work
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** Maritime English - part 2 **Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (Part 1)
Units of credit (UC)	3
Hours of formal lecture/practical exercise	24/24
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: - calculate a great circle route between two positions, including initial course, distance, gain, vertex, knot, waypoints, and final course at arrival; - identify an unknown celestial body ; - efficiently determine position based on celestial observations, with a focus on practical application; - calculate and interpret the error of a gyrocompass; - understand and apply the practical compensation of both the gyrocompass and the magnetic compass; - demonstrate an overview of the requirements for standing watch during the different stages of a voyage, including port watchkeeping; - describe and apply the core responsibilities of a junior officer of the watch in realistic scenarios; - interpret and correctly apply the use of checklists, and perform proper watch handovers in accordance with bridge procedures.

<table>
<tr><td>Course content</td><td>The student gains insight into the requirements of standing watch as an officer of the watch, both at sea and in restricted waters, including port operations. The course explores all relevant aspects of bridge watchkeeping in detail, such as the use of checklists, watch handover procedures, and the specific duties of a junior officer of the watch. The student applies the acquired knowledge by preparing and developing realistic scenarios.

The student becomes familiar with the purpose and applications of great circle navigation. He/she learns to identify unknown stars through various methods and to determine the vessel’s position efficiently based on celestial observations, with a strong focus on practical usability. The student analyses potential sources of error in position fixing and their effect on accuracy. He/she also gains practical understanding of both gyrocompass and magnetic compass compensation.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
oral exam with written preparation en integrated practical test</td></tr><tr><td colspan="4">Second session
oral exam with written preparation and written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- Obtain a minimum of 8/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Parallel ruler and compass.
- Plotting sheets.
- Nautical Almanac. (latest ed.). Blue Lake, US: Paradise Cay Publications.
- Norie, J. W., Blance, G. (2007). Norie’s Nautical Tables: With an Explanation of Their Use. London, UK: Imray, Laurie, Norie & Wilson.
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Spherical trigonometry</td></tr>
<tr><td>Additional information</td><td>- Bowditch, LL.D. (2002). The American Practical Navigator, volume 1 & 2. US: Defense Mapping Agency Hydrographic Center.
- British Admiralty. (2016). NP 100, The Mariner’s Handbook, (11th ed.). London, UK: United Kingdom Hydrographic Office.
- International Chamber of Shipping. (2016). Bridge Procedures Guide, (6th ed.). London, UK: ICS.
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**NAVIGATION (PART 3) (8 UC)**
Course element	**ECDIS part 2** **(HZS-NW-NAV-NW320)**
Lecturer(s)	**Inez HOUBEN, Veerle VAN DRIESSCHE**
Lecturer in charge	Veerle VAN DRIESSCHE
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** Maritime English - part 2 **Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (Part 1)
Units of credit (UC)	1
Hours of formal lecture/practical exercise	-/20
Semester + module(s)	Semester 1, Module 1.1 -/- **Semester 1, Module 1.2** **-/12** 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: - analyse previous accidents to detect limitations in the ECDIS system; - review the electronic charts critically and take into account any inaccuracies; - look up the chart accuracy in an ECDIS system; - critically approach a GNSS position; - determine the relative accuracy of the system by looking at the accuracy of the position and that of the chart; - utilise the various functionalities of the ECDIS; - apply positon fixing with an ECDIS while on watch.

Course content	The student acquires the knowledge and skills required for the safe and correct use of Electronic Chart Display and Information Systems (ECDIS), in accordance with the STCW competencies defined in Table A-II/1 of the STCW Code. The student learns to interpret electronic navigational charts and to correctly configure and prepare an ECDIS for navigation. Attention is given to route planning, route monitoring, alarm management, and the correct setting of safety parameters. The student develops an understanding of the capabilities and limitations of ECDIS and understands the importance of continuous visual position control in addition to GNSS systems. Furthermore, the student learns to critically assess the reliability and accuracy of electronic chart data and hydrographic surveys. The student practices the operational use of ECDIS on simulators and applies these skills during integrated exercises on a fully equipped ship's bridge.
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2) - Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3) - Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4) - Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9) - Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12) - Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)
Examination	<table><tr><td>Following Module 1.1 -</td><td>**Following Module 1.2** **permanent evaluation**</td><td>Following Module 2.1 -</td><td>**Following Module 2.2** **permanent evaluation**</td></tr><tr><td colspan="4">**Second session** **oral exam**</td></tr></table>
Caesura measures	- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session.
Required study material	- Lecturer's course text available. - NP5012 Guide to ENC Symbols used in ECDIS - No calculator allowed.
Recommended preliminary competences	ECDIS (part 1)

Additional information	- Hecht, H., Berking, B., Jonas, M. & Alexander, L. (2017). *The electronic chart: fundamentals, functions, data and other essentials: a textbook for ECDIS use and training*. Lemmer, The Netherlands: Geomares Publishing. ISBN 978-90-825818-1-2. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended.* London, UK: IMO. - Norris, A. (2008). *Integrated bridge systems vol. 1 radar and AIS. London, UK:* The Nautical Institute. ISBN 1-87077-95-4. - Norris, A. (2010). *Integrated bridge systems vol. 2 ECDIS and positioning*. London, UK: The Nautical Institute. ISBN 978-1-906915-11-7. - Weintrit, A. (2009). *The electronic chart display and information system, an operational handbook.* London , UK: CRC Press. ISBN 978-04-1548246-2.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 3) (8 UC)**
Course element	**Chart work (part 3) & Voyage planning (HZS-NW-NAV-NW325)**
Lecturer(s)	**Patricia VAN LANGENHOVEN**
Lecturer in charge	Veerle VAN DRIESSCHE
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	Portfolio
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Maritime English - part 2 **Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (Part 1)
Units of credit (UC)	1
Hours of formal lecture/practical exercise	-/12
Semester + module(s)	**Semester 1, Module 1.1 -/4** | **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: - have an understanding of how to draw up a good voyage plan; - be able to argue the best choice of route to follow in function of the prevailing circumstances; - look up voyage information through digital nautical publications; - use and read digital charts; - use specific voyage planning software.
Course content	Through step-by-step guidance, the student learns to draw up a good voyage plan. The emphasis is placed on: - weighing the best choice of route in function of the prevailing circumstances; - plotting the route, loxodromic and orthodromic, on digital charts; - looking up the necessary voyage information in the available nautical publications (on paper and digitally); - the use of voyage planning software with integrated electronic charts. The student also experiences that specific attention is paid to passage planning in Arctic sea areas.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
-</td><td>Following Module 2.2
-</td></tr>
<tr><td colspan="4">Second session
oral exam</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Parallel ruler and compass.
- British Admiralty. (2016). NP 5012, Admiralty Guide to ENC Symbols used in ECDIS. London, UK: United Kingdom Hydrographic Office.
- Norie, J. W., Blance, G. (2007). Norie’s Nautical Tables: With an Explanation of Their Use. London, UK: Imray, Laurie, Norie & Wilson.
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Anwar, N. (2006). Passage Planning Principles. London, UK: Seamanship International.
- Bowditch, LL.D. (2002). The American Practical Navigator, volume 1 & 2. US: Defense Mapping Agency Hydrographic Center.
- British Admiralty. (2016). NP 100, The Mariner’s Handbook, (11th ed.). London, UK: United Kingdom Hydrographic Office.
- International Chamber of Shipping. (2016). Bridge Procedures Guide, (5th ed).London, UK: ICS.
- International Maritime Organization. (1978). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978, as amended. London, UK: IMO.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 3) (8 UC)**
Course element	**Radar - part 2: simulator (HZS-NW-NAV-NW330)**
Lecturer(s)	**Peter DOTSELAERE, Christophe SENSEN, Veerle VAN DRIESSCHE**
Lecturer in charge	Veerle VAN DRIESSCHE
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Maritime English - part 2 **Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (Part 1)
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 -/12** | **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: - recognise navigational problems and apply this knowledge in plotting the safest and most favourable route; - make correct use of the various instruments on the bridge; - detect limitations and/or incorrect settings of instruments; - approach data from radar/arpa critically; - understand and analyse data from all available instruments; - use this analysis to make a correct assessment of a possible hazard; - evaluate navigational hazards, find a solution, and apply it; - strictly and accurately apply the Regulations for the Prevention of Collisions at Sea; - communicate correctly, both with crew members and with third parties; - contribute to a constructive working atmosphere on the bridge; - apply the acquired MRM competencies correctly.

<table>
<tr><td>Course content</td><td>The student learns to apply acquired theoretical knowledge in practice, i.e. on fully equipped ship bridges. The student gets acquainted with the great importance of learning to work in a realistically simulated situation, where it is necessary to take into account active ships and to make use of all navigational means available.
All cross-curricular aspects of navigation are gradually addressed, combined with related subjects, such as manoeuvring, communication, chartwork, instruments, teamwork and bridge procedures, MRM and regulation of maritime traffic.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr><tr><td colspan="4">Second session
oral exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- To be able to communicate effectively, fluently and purposefully.</td></tr>
<tr><td>Required study material</td><td>- Parallel ruler and compass.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
</table>

Additional information	- Bole, A., Wall, A., Norris, A. (latest ed.). *Radar and ARPA Manual.* Amsterdam, The Netherlands: Elsevier. - British Admiralty. (latest ed.). *Admiralty list of Radio Signals.* London, UK: United Kingdom Hydrographic Office. - British Admiralty. (latest ed.). *Captains guide to port entry.* London, UK: United Kingdom Hydrographic Office. - British Admiralty. (latest ed.). *NP Tide tables.* London, UK: United Kingdom Hydrographic Office. - British Admiralty. (latest ed.). *Pilot books.* London, UK: United Kingdom Hydrographic Office. - Cockcroft A.N., Lameijer, J.N.F. (2011). *A guide to the Collision Avoidance Rules*, (7th ed.). Oxford, UK: Heinemann Professional Publishing. - International Chamber of Shipping. (2016). *Bridge Procedures Guide,* (5th ed).London, UK: ICS. - International Maritime Organization. (1978). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) including 2010 Manila amendments.* London, UK: IMO. - International Maritime Organization. (2003). *Colreg: Convention on the International Regulations for Preventing Collisions at Sea, as amended.* London, UK: IMO. - International Maritime Organization. *Assembly resolutions A.477(Xll)-A.823(1 9)-A.424(Xl)-A.478(Xll)-A.824(1 9)-A 422(Xl), as amended*. London, UK: IMO. - Lownsborough, R., Calcutt, D. (1993). *Electronic Aids to Navigation: Radar and ARPA*. London, UK: Edward Arnold.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**NAVIGATION (PART 3) (8 UC)**
Course element	**Telecommunication (HZS-NW-EXP-NW311)**
Lecturer(s)	**Raf MESKENS, Dries VAN ZUNDERT**
Lecturer in charge	Veerle VAN DRIESSCHE
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Maritime English - part 2 **Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (Part 1)
Units of credit (UC)	-
Hours of formal lecture/practical exercise	-/16
Semester + module(s)	**Semester 1, Module 1.1 -/8** | **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: - operate and use the various GMDSS devices correctly, both in normal operation and in emergency, urgency, and safety traffic situations; - identify the limitations of the GMDSS devices; - demonstrate the ability to communicate correctly in the English language via radio telephony; - correctly cancel false calls.
Course content	The student learns to work with all mandatory and/or optional GMDSS (Global Maritime Distress and Safety Systems) devices in emergency, urgency, and safety situations, as well as during normal operation. He/she becomes familiar with the limitations of the respective devices and thus gains insight into their operation..

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
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<tr><td colspan="4">Second session
oral exam with written preparation</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 8/20 for each part of the exam to pass for this element;
- To be able to communicate effectively, fluently and purposefully.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Search & Rescue (SAR)
Maritime English - part 2</td></tr>
<tr><td>Additional information</td><td>- British Admiralty. (latest ed.). Admiralty list of Radio Signals, Volume 5, Global Maritime Distress and Safety System. London, UK: United Kingdom Hydrographic Office.
- International Maritime Organization. (latest ed.). GMDSS manual. London, UK: IMO.
- International Telecommunication Union. (latest ed.). The Radio Regulations. Geneva, Switzerland: ITU.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**REGULATIONS OF MARITIME TRAFFIC (PART 3) AND MANOEUVRES (PART 2) (3 UC)**
Course element	**Manoeuvres (part 2)** **(HZS-NW-NAV-NW305)**
Lecturer(s)	**Denis STEVENS, Dries VAN ZUNDERT**
Lecturer in charge	Klaas DE HERT
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (Part 1)
Units of credit (UC)	1
Hours of formal lecture/practical exercise	-/24
Semester + module(s)	**Semester 1, Module 1.1 -/6** | **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: Module sailing: - recognise navigational problems and apply this knowledge in plotting the safest and most favourable route; - make correct use of the various instruments on the bridge; - detect limitations and/or incorrect settings of instruments; - approach data from RADAR/ARPA critically; - understand and analyse data from all available instruments; - use this analysis to make a correct assessment of a possible hazard; - evaluate navigational hazards, find a solution, and apply it; - strictly and accurately apply the 'Regulations for Preventing Collisions at Sea'; - communicate correctly, both with crew members and with third parties; - contribute to a constructive working atmosphere on the bridge; - apply the acquired MRM competences correctly; - compare infos from chart and/or Ecdis with the radar by sailing blind. Module manoeuvring: - explain and apply propeller and kick effects to manoeuvring; - explain and apply current, wind effects on the ship and work with these elements in order to moor and tie up in a smooth and proper manner.

<table>
<tr><td>Course content</td><td>This course has two parts: Sailing and Manoeuvring.
Module sailing:
The student gets acquainted with the great importance of learning to work in a realistic situation, where it is necessary to take into account active ships and to make use of all means of navigation available. All cross-curricular aspects of navigation are gradually addressed, combined with related subjects, such as manoeuvring, communication, chartwork, instruments, teamwork and bridge procedures, MRM and regulation of maritime traffic. The student gets acquainted with navigating blind by only navigating on map and radar in a realistic environment.
Module manoeuvring:
The student applies the acquired theoretical manoeuvering knowledge in practice by mooring and unmooring with the ship without and with current, with 1 and/or 2 propellers.
This course contains 2 trips back and forth on the Scheldt (Antwerp - Flushing) spread over 2 weekends. The student gets acquainted with the tasks and role of an officer on watch by sailing on vessels under the guidance of a pilot. The student analyses all cross-curricular aspects of navigation, combined with related subjects, such as manoeuvring, communication, chartwork, instruments, teamwork and bridge procedures, MRM and regulation of maritime traffic.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
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permanent evaluation</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr><tr><td colspan="4">Second session
second session impossible</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session.</td></tr>
<tr><td>Required study material</td><td>- No calculator allowed.</td></tr>
</table>

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. - MacElrevey, D.H., MacElrevey, D.E. (2018). Shiphandling for the Mariner. (5th ed.). Baltimore, US: Cornell Maritime Press. ISBN 9780764354588.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**REGULATIONS OF MARITIME TRAFFIC (PART 3) AND MANOEUVRES (PART 2) (3 UC)**
Course element	**Manoeuvring simulator (part 2): simulator (HZS-NW-NAV-NW306)**
Lecturer(s)	**Klaas DE HERT, Inez HOUBEN**
Lecturer in charge	Klaas DE HERT
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (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 -/8** | **Semester 2, Module 2.2 -/4**
Learning objectives	At the end of the course, the student is expected to be able to: - perform basic maneuvers (mooring, docking, anchoring) with different types of propellers (CPP, FPP); - execute propulsion and rudder orders correctly; - interpret and use ECDIS, radar, and other sensors correctly; - accommodate the effects on the ship of a transition between waters with and without current; - perform a complete maneuver of entering or exiting a lock; - have an understanding of the forces acting on the vessel (except wind) and thereby predict the future course; - be able to detect a deviation from the course in time and apply the necessary corrective measures; - give orders clearly and at the right time.
Course content	The student learns to apply acquired theoretical maneuvering knowledge in practice by practicing basic maneuvers and challenging situations. On a realistic ship maneuvering simulator, the student is presented with a situation. He/she receives a briefing beforehand and must follow the advice, give the right commands (rudder and propulsion) at the appropriate moment, and act correctly to successfully complete the exercise. He/she uses the ECDIS, radar, and other nautical instruments to analyze the situation correctly. Knowledge, teamwork, and proper action are important.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
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permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr>
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second session impossible</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- To be able to communicate effectively, fluently and purposefully.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Baudu, H. (2014). Ship Handling. Enkhuisen, The Netherlands: Dokmar Maritime Publishers. ISBN 9799071500275.
- Hooyer, H. H. (2010). Behavior and handling of ships. Centerville, Maryland, US: Cornell Maritime Press. ISBN: 0870333062.
- Paffett, J. A. (1990). Ships and Water. Niwot, Colorado, US: Seaways. ISBN 9781870077064.
- Rowe, R. W. (1996). The Shiphandler’s Guide for Masters and Navigating Officers. London, UK: The Nautical Institute. ISBN: 9781870077354.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**REGULATIONS OF MARITIME TRAFFIC (PART 3) AND MANOEUVRES (PART 2) (3 UC)**
Course element	**Regulations for maritime traffic (part 3) (HZS-NW-NAV-NW350)**
Lecturer(s)	**Frederik BOUMANS**
Lecturer in charge	Klaas DE HERT
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	**Strict succession (must have followed and passed)** Navigation (Part 2) Regulations of maritime traffic (Part 2) and manoeuvres (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: - recognise the different types of vessels, as well as correctly interpret their movement and length by means of displayed lights and/or day marks; - analyse a simple case study by verifying whether the correct regulations were applied for all vessels involved and to correct where these were not correctly followed.
Course content	The student learns to apply the knowledge of the 1st and 2nd Bachelor in a simple and practical way by making exercises and analysing case studies.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module
1.1
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2.1
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2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- International Maritime Organization. (2003). Colreg: Convention on the International Regulations for Preventing Collisions at Sea, as amended. London, UK: IMO.
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Deseck, P. (2007). International Regulations For Preventing Collisions at Sea, Ostend, Belgium.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**METEOROLOGY (PART 2) AND OCEANOGRAPHY (3 UC)**
Course element	**Meteorology (part 2) and oceanography (HZS-NW-NAV-NW340)**
Lecturer(s)	**Anne-Pascale MORNARD**
Lecturer in charge	Anne-Pascale MORNARD
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Meteorology (Part 1)
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: - evaluate the dangers of a hurricane and devise a solution; - recognise ocean currents, and apply this knowledge to plotting the most favourable course; - understand and analyse weather charts and use this analysis to plot the most favourable route; - understand the principle of weather routing and demonstrate this using a simple practical example; - recognise and explain maritime weather phenomena worldwide.
Course content	The student acquires further knowledge of the impact of the weather on a ship and its possible consequences. More specifically, the following topics are covered: - hurricane navigation and practical examples; - ocean currents; - explanation and interpretation of weather charts; - weather routeing; - elements from maritime climatology that are important for a seafarer.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the tools for determining position and for navigation, including traditional and electronic charts, chartwork methodology and seafaring calculations, navigation regulations, knowledge of tides, meteorology and radar images. (BA-NW-3)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
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-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Burch, D. (2013). Modern Marine Weather. Seattle, Washington, US: Starpath Publications. ISBN 9780914025337.
- Chen, M., Chesneau, L. (2008). Heavy Weather Avoidance and Route Design. Arcata, California, US: Paradise Cay Publication. ISBN 9780939837781.
- Cornes, M., Ives, E. (2009). Reeds Maritime Meteorology. London, UK: Adlard Coles Nautical. ISBN 9781472902658.
- van der Ham, C. (2003). Meteorologie en Oceanografie voor de Zeevaart. Bussum, Nederland: De Boer Maritiem. ISBN 9789064104015.
- Van Dorn, W. (1992). Oceanography and Seamanship. Centreville, Maryland, US: Cornell Maritime Press. ISBN 9780870334344.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SAFETY TECHNOLOGY (PART 3) AND MARITIME ECOLOGY AND ENVIRONMENTAL LEGISLATION (4 UC)**
Course element	**Safety technology (Part 3) (HZS-NW-EXP-NW323)**
Lecturer(s)	**Frederik BOUMANS, Raf MESKENS, Anne-Pascale MORNARD**
Lecturer in charge	Helen VERSTRAELEN
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	2
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 -/4** | **Semester 2, Module 2.2 -/8**
Learning objectives	At the end of the course, the student is expected to be able to: - describe and discuss the risks and control measures related to operations on gas and chemical tankers, as well as vessels using gas as fuel; - apply safe working methods and procedures in line with legislation, industry standards, and personal safety on board — including entry into enclosed spaces, hot work, and other permit-required tasks; - select the appropriate personal protective equipment based on the work and conditions (including chemical suits, hearing protection, etc.); - describe the relevant procedures in case of emergencies on board tankers (including activation of ESD and ERC systems); - indicate where and how to find missing information related to cargo and its hazards (such as MSDS sheets and the MFAG); - demonstrate the practical competencies required for *Proficiency in Survival Craft and Rescue Boats other than fast rescue boats* (PSCRB); - independently organise, execute, and evaluate a safety drill related to shipboard operations.

<table>
<tr><td>Course content</td><td>The student builds on the knowledge gained in previous safety training courses. First, he/she makes a direct connection between the nature of the transported cargo (with a focus on liquid cargoes), the associated hazards, and the appropriate firefighting and protective equipment and techniques. The importance of the MSDS document in conjunction with the MFAG is emphasized.

Next, the student becomes familiar with the procedures required for entering enclosed spaces, with specific attention to atmospheric testing and monitoring, and the correct preparation of the necessary entry documentation (‘permits’). The work permit system is reviewed using new examples, such as the ‘hot work permit’.

The student works through the bunkering checklist and learns to recognize and apply key terms and safety concepts. Finally, the risks related to vibration exposure are discussed, and the student learns to distinguish between different types of hearing protection, along with their advantages and disadvantages.

In the practical part of the course, the student independently plans, carries out, and evaluates exercises related to entering and evacuating a simulated enclosed space. He/she also practices the proper use of survival craft and rescue boats, excluding fast rescue boats. The student uses equipment for working at height.</td></tr>
<tr><td>Learning outcomes</td><td></td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
oral exam with written preparation</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr>
<tr><td colspan="4">Second session
oral exam with written preparation</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Safety clothing.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
</table>

Additional information	- International Association on Classification Societies. (latest ed.). *Guideance for entry into enclosed spaces*. London, UK: IACS. - International Chamber of Shipping / OCIMF. (latest ed.). *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.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SAFETY TECHNOLOGY (PART 3) AND MARITIME ECOLOGY AND ENVIRONMENTAL LEGISLATION (4 UC)**
Course element	**Maritime ecology and environmental legislation (HZS-NW-EXP-NW319)**
Lecturer(s)	**Helen VERSTRAELEN**
Lecturer in charge	Helen VERSTRAELEN
Educational programme	**Third Year Bachelor in Nautical Sciences**

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.

<table>
<tr><td>Course content</td><td>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.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Basic tanker training (oil, gas, chem) & IGF
Ship's exploitation (part 1)</td></tr>
<tr><td>Additional information</td><td>- 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.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**BASIC TANKER TRAINING (OIL, GAS, CHEM) & IGF (3 UC)**
Course element	**Basic tanker training (oil, gas, chem) & IGF (HZS-NW-EXP-NW313)**
Lecturer(s)	**Ynse JANSSENS, Anne-Pascale MORNARD, Denis STEVENS**
Lecturer in charge	Anne-Pascale MORNARD
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises			
Other teaching methods				
Instruction language	Dutch/French + English			
Required preliminary credit(s)	**Strict succession (must have followed and passed)** Stability (Part 2)			
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: - operate the simulator; - name the different parts of the loading and discharging process; - outline the pipelines through which a tanker will be loaded and/or discharged; - carry out a cargo calculation and conclude whether the vessel can be loaded correctly; - understand why some loading calculations are erroneous; - to partially load and/or unload a tanker; - identify, recognise and solve problems; - manage tank cleaning.			

<table>
<tr><td>Course content</td><td>During this course, the student gains an understanding of the issues of storage, handling and transportation of crude oil, chemicals and liquefied gas in accordance with the 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);
- Basic training on ships subject to IGF Code (A-V/3-1);
- Advanced training for oil cargo operations (A-V/1-1-2);

- Model Courses 1.01, 1.02, 7.13.
The following topics will be covered:
- Extensive introduction to the construction and equipment of the various tanker types;

- Valves and pipeline systems on board;
- cargo handling pumps;
- Tank cleaning;
- Measuring and sampling of liquid cargo;
- Tank vent;
- Tankers & Marpol annex 1;

- Introduction to inert gas.
The student learns to work with the simulator and carries out a load calculation. On the basis of the calculated amount of cargo the student will load the ship. A tank cleaning exercise completes the practical part.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
written and permanent evaluation</td><td>Following Module 2.1
-</td><td>Following Module 2.2
-</td></tr>
<tr><td colspan="4">Second session
oral exam with written preparation and written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
</table>

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. (2010). *Tanker operations: A handbook for the person-in-charge.* (5th ed.). 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. (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 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.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**SHIP'S EXPLOITATION (PART 1) (3 UC)**
Course element	**Ship's exploitation (part 1)** **(HZS-NW-EXP-NW306)**
Lecturer(s)	**Marieke UTEN**
Lecturer in charge	Marieke UTEN
Educational programme	**Third Year Bachelor in Nautical Sciences**

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 -/-	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: - understand the legal framework in which ships operate and interpret concepts such as flag, ownership, and registration; - know and be able to interpret the origins and contents of the major IMO conventions; - be familiar with the administrative obligations associated with the operation of a ship; - know the survey requirements for ship certificates; - know the duties of the classification societies; - distinguish and describe the different types of maritime insurance; - explain and interpret the system of Port State Control.			
Course content	The student discovers the content of the most important conventions developed by the IMO and the UN. The student acquires a general overview of the legal framework in which ships are operated. The course also gives the student a picture of the administrative obligations within the sector in relation to certificates for ship, crew, insurance, classification, etc. Focus is on the various forms of maritime insurance. The principles of Port State Control are extensively discussed.			

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module
1.1
-</td><td>Following Module
1.2
-</td><td>Following Module
2.1
-</td><td>Following Module
2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- 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 Code for the Construction Equipment of Ships Carrying Liquefied Gases in Bulk. London, UK: IMO.
- International Maritime Organization. (latest ed.). International Safety Management Code (ISM), as amended. London, UK: IMO.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**STABILITY (PART 3) (3 UC)**
Course element	**Stability - part 3** **(HZS-NW-EXP-NW303)**
Lecturer(s)	**Laura DE WEL**
Lecturer in charge	Klaas DE HERT
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Stability (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: - describe and interpret dynamic stability, evaluate it in relation to the IMO criteria and weather criteria; - calculate an approximate GM using a pendulum test; - describe and interpret the contents of the intact stability code; - calculate and interpret the changes in stability during docking or stranding and, if necessary, propose appropriate measures; - make a simplified calculation of damage stability, i.e. draught, heel, and trim; - carry out a draught survey; - calculate, perform, and repeat a draught survey for the calculation of the data for the empty vessel in the event of significant changes to the structure of the vessel; - explain, calculate, and evaluating the IMO criteria for reduced stability on board bulk carriers (carrying a cargo that can shift).

<table>
<tr><td>Course content</td><td>In the first part of this course the student learns how to determine the true deplacement on the basis of the draught reading, in order to ultimately determine the quantity of loaded or unloaded goods. The student is also introduced to two different stability tests, the pendulum test and the inclination test, to determine an approximate value for the GM and also to determine the data of the empty vessel.
In the second part, the student is invited to acquire knowledge about:
- dynamic stability, taking into account external forces such as wind and waves. Here he/she will also see the comparison with the various IMO criteria and weather criteria;
- the contents of the intact stability code, as issued by the IMO, after which bulk carriers carrying a cargo that shifts, such as grain, or liquefaction and dynamic separation of bulk cargoes are all examined in more detail.
The third part deals with the changes in stability during docking. Here, the student is introduced to the greatest dangers and appropriate measures.
The final part deals specifically with damage stability, in which the student learns to determine draught, heel, and trim after structural damage by means of simplified calculations.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Rhodes, M. (latest ed.). Ship Stability strength and loading principles, Edingburgh, UK, Witherby Seamanship International, ISBN: 9781856099448
- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Barrass, B., Derrett, D.R. (latest ed.) Ship Stability for Masters and Mates. London, UK: Butterworth-Heinemann.
- Clark, C. (2008). Stability, Trim and Strength for Merchant Ships and Fishing Vessels. London, UK: The Nautical Institute. ISBN: 9781870077873.
- International Maritime Organization. (1966). International Load Lines Convention (ILL) 1966, as amended. London, UK: IMO.
- International Maritime Organization. (latest ed.). International Code on Intact Stability. London, UK: IMO.
- Rhodes, M. (2009). Ship Stability OOW. Edingburgh, UK: Witherby Seamanship International.
- van Dokkum, K. (latest ed.). Ship Stability. Enkhuizen, The Netherlands: Dokmar.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**BASIC DREDGING & OFFSHORE TRAINING (3 UC)**
Course element	**Basic Dredging & Offshore Training (HZS-NW-EXP-NW331)**
Lecturer(s)	**Peter DOTSELAERE, Dries VAN ZUNDERT**
Lecturer in charge	Dries VAN ZUNDERT
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Excursion
Instruction language	English
Required preliminary credit(s)	
Units of credit (UC)	3
Hours of formal lecture/practical exercise	24/8
Semester + module(s)	Semester 1, Module 1.1 -/- | Semester 1, Module 1.2 -/- | **Semester 2, Module 2.1 12/8** | **Semester 2, Module 2.2 12/-**
Learning objectives	At the end of the course, the student is expected to be able to: - provide an overview of the functioning and context of the offshore and dredging industries; - describe the production process of different types of dredging vessels and explain their components and operational cycle; - explain the basic principles of offshore wind farm development, pipeline installation, and offshore construction works; - understand the difference between diesel and diesel-electric propulsion systems and the application of various pump types in the dredging process; - formulate technical proposals for carrying out a dredging or offshore project based on location, soil type, and operational constraints.
Course content	The student becomes familiar with the operation and applications of techniques and vessels specific to the offshore and dredging industry. He/she learns to understand the differences between various types of projects such as oil and gas exploration, offshore wind farms, pipeline installation, coastal protection, land reclamation, and port construction. The student learns to analyse the functioning of dredging vessels such as TSHD and CSD and to identify their components. He/she gains insight into the use of offshore construction vessels and installation methods. The student becomes acquainted with the basic operation of centrifugal pumps, propulsion systems, and the importance of optimized production scenarios. He/she applies the theory to realistic situations through a company visit.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Possess the required knowledge and skill to carry out other operational tasks, including watchkeeping, loading and discharging operations, manoeuvres, ship administration and ship exploitation in accordance with the law of the sea, radio communications. (BA-NW-4)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Possess advanced knowledge and understanding in one or more topics from the nautical research field such as health and safety (strategic management, maritime medical emergencies), maritime transport (analysis of shipping markets, supply chain management, port management and policy, business economics), marine environmental technology (advanced maritime ecology), maritime energy issues, maritime techniques (introduction to hydrography, dynamic positioning, unusual ships - olie-, gas- (LPG/LNG) and chemical tankers, advanced maritime technology and safety, advanced stability, shipbuilding, propulsion and automation), human resources and communication (data analysis). (MA-NW-8)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module
1.1
-</td><td>Following Module
1.2
-</td><td>Following Module
2.1
permanent
evaluation</td><td>Following Module
2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Ship technique (Part 2)</td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**ELECTRONICS 2 AND INFORMATICS (5 UC)**
Course element	**Electronics (part 2)** **(HZS-WE-TE-NW312T)**
Lecturer(s)	**Peter BUEKEN, Tim GEERTS, Jonas JOOS**
Lecturer in charge	Tim GEERTS
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Electronics (Part 1)
Units of credit (UC)	3
Hours of formal lecture/practical exercise	24/9
Semester + module(s)	**Semester 1, Module 1.1** **12/-** | **Semester 1, Module 1.2** **12/-** | **Semester 2, Module 2.1** **-/3** | **Semester 2, Module 2.2** **-/6**
Learning objectives	At the end of the course, the student is expected to be able to: - recognise and use the different logical gates; - draw a combinational circuit; - build a sequential system; - put together a digital counter; - recognise different modulation techniques, situate them in application areas and evaluate them; - analyse AC networks by means of a locus diagram; - explain and apply the concept of resonance; - draw a simple circuit with one or more digital and/or analogue sensors and actuators; - build a simple circuit with sensors and actuators; - programme a microprocessor in a correct and structured way to read out a simple circuit with sensors and/or actuators; - identify deficiencies, problems and errors when building and programming the circuit and improve the system on the basis of this analysis.

<table>
<tr><td>Course content</td><td>The student receives an introduction in the field of digital electronics. He/she gets an enumeration of logical gates and learns to use them in combinatorial and sequential circuits. The student learns the basic principles of telecommunication in a theoretical way. He/she becomes acquainted with different modulation techniques such as amplitude modulation and frequency modulation. The student also becomes acquainted with some techniques used in digital communication such as sampling and modulation of these samples. The student learns to use locus diagrams to analyse networks in the frequency domain.

Furthermore, the student learns to build simple circuits with simple digital and analogue sensors and actuators and a microprocessor, and learns to programme a microprocessor to control and read these circuits. In doing so, the student also becomes familiar with the basic techniques of (obligatory) programming and the basic concepts of control technology and automation.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
oral exam with written preparation</td><td>Following Module 2.1
-</td><td>Following Module 2.2
oral exam with written preparation</td></tr><tr><td colspan="4">Second session
oral exam with written preparation</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- Obtain a minimum of 8/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Integral calculus (part 2) and statistical methods for scientific research</td></tr>
<tr><td>Additional information</td><td>- Frenzel, L. (2016). Principles of Electronic Communication Systems. (4th ed.). New-York, US: McGraw-Hill Education. ISBN: 0073373850
- Horowitz, P., Winfield, H. (2015). The Art of Electronics. (3rd ed.). New York, US: Cambridge University Press. ISBN: 0521809266.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**ELECTRONICS 2 AND INFORMATICS (5 UC)**
Course element	**Informatics and Cybersecurity (HZS-WE-NW360)**
Lecturer(s)	**Jonas JOOS**
Lecturer in charge	Tim GEERTS
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** Electronics (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: -translate a task described in natural language into a functioning program in Python and ensure its correct execution by a computer; -test, debug, and optimize a program for correct and efficient operation; -make informed decisions when implementing a program, with attention to efficiency, readability, and accuracy; -have basic knowledge of cybersecurity and secure programming practices, including identifying vulnerabilities and protecting data; -have practical knowledge of the fundamental principles of object-oriented programming
Course content	The student learns to program and develops algorithmic thinking skills—gaining an understanding of writing, analyzing, and optimizing computer programs to solve various problems. He/she becomes familiar with the fundamental components of a programming language, such as variables, data types, operators, control structures, and data structures like lists, tuples, files, and modules. Special attention is given to writing structured and reusable code. Object-oriented programming is introduced as a method for systematically developing complex systems. The student learns to apply programming solutions to real-world problems, such as processing and analyzing data, efficiently managing files, and visualizing information. Additionally, cybersecurity is introduced, providing the student with insight into secure programming practices, identifying vulnerabilities, and protecting data. Throughout the course, the Python programming language is used as the primary tool to explore and put these concepts into practice.

<table>
<tr><td>Learning outcomes</td><td></td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
written exam</td><td>Following Module 2.1
-</td><td>Following Module 2.2
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<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Punch, W. and Enbody, R. (2016). The Practice of Computing using Python, 3th edition. Pearson Education, ISBN 978-0-13-437976-0.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**PROPULSION (PART 1) (3 UC)**
Course element	**Propulsion (part 1) - theory (HZS-WE-TE-NW311T)**
Lecturer(s)	**Evert LATAIRE**
Lecturer in charge	Evert LATAIRE, Kris VERBEECK
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** Mathematics and Physics (Part 2) Thermodynamics & Ship's construction (Part 2)
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 12/-** | Semester 2, Module 2.2 -/-
Learning objectives	At the end of the course, the student is expected to be able to: - compare different fuels; - understand the operation of a two-stroke and a four-stroke engine; - describe different types of two-stroke engines on board ships; - understand the operation of a steam turbine; - compare the operation of different types of steam boilers.
Course content	The student becomes acquainted with the theoretical operation of a two-stroke and four-stroke engine. He/She learns to ask critical questions about the different types of diesel oil and new types of fuel. The student learns how the most important cycles work on board a ship (e.g. fuel cycles, cooling water, lubricating oil and compressed air). He/She studies the operation of a steam turbine and the production of steam on board ships.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)
- Possess sufficient basic knowledge and understanding of exact and applied sciences (mathematics, physics, chemistry, thermodynamics and electronics, computer science) in order to deal with technical systems and problems on board in a responsible manner. (BA-NW-6)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
-</td><td>Following Module 1.2
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-</td><td>Following Module 2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Only ordinary scientific calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Chemistry</td></tr>
<tr><td>Additional information</td><td>- International Maritime Organization. (2006). Model Course 1.02: Specialized training for oil tankers. London, UK: IMO.
- International Maritime Organization. (2014). Model Course 7.01: Master and chief mate. London, UK: IMO.
- Maanen, P. van, & van der Ent, A. (2000). Scheepsdieselmotoren. Harfsen, Nederland: Nautech.
- Pounder, C. C., Wilbur, C. T., & Wight, D. A. (1984). Pounder’s Marine diesel engines. Marine engineering series (6th ed.). Oxford, UK: Butterworth-Heinemann.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**PROPULSION (PART 1) (3 UC)**
Course element	**Propulsion (part 1) - exercises (HZS-WE-TE-NW323T)**
Lecturer(s)	**Kris VERBEECK**
Lecturer in charge	Evert LATAIRE, Kris VERBEECK
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Standard succession (must have followed)** Mathematics and Physics (Part 2) Thermodynamics & Ship's construction (Part 2)
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: - use the engine simulator correctly; - analyse the operation of various technical systems on board; - make the link between the theory course and its practical implementation; - evaluate the dangers and challenges of gas bunkering
Course content	The student learns how to use the Kongsberg Engine Simulator software. Based on this, theoretical concepts from the theory course are tested against the (simulated) reality. The student acquires insight into the operation of a variety of auxiliary and primary engines and how they interact with each other. The student performs two simulated bunkeropations on a dual fuel model.
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 deck officers on seagoing vessels; and hereby comply with STCW standards at operational level. (BA-NW-1) - Have a thorough knowledge and understanding of the general and specific technical aspects of merchant ships, including structural elements, ropes/hawsers/cables, energy supplies and propulsion systems, nautical instruments, rescue and communication resources, maintenance on board, classification society guidelines, stability of the ship. (BA-NW-2)

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			
Caesura measures				
Required study material	- Lecturer's course text available. - Only ordinary scientific calculator allowed.			
Recommended preliminary competences				
Additional information	- Kuiken, K. (2017). *Diesel Engines.* Onnen, The Netherlands: Target Global Energy Training. ISBN 9789079104055.			

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MARITIME ECONOMICS (3 UC)**
Course element	**Maritime economics (HZS-WE-HT-NW313)**
Lecturer(s)	**Theo NOTTEBOOM**
Lecturer in charge	Theo NOTTEBOOM
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	
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 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: • analyse and assess the macro environment in which the merchant shipping industry operates; • understand the functioning of key shipping markets, including shipbuilding, shipbreaking and freight markets, across market segements such as liner and bulk shipping; • demonstrate a solid grasp of how shipping company managers and their clients can navigate market cycles, make strategic decisions, and manage risk effectively.
Course content	In this course, the student is introduced to the core questions and mechanisms of maritime economics. He/she starts with exploring the market environment in which shipping companies operate, followed by a structured overview of the main segments of the maritime industry. Using a range of datasets and industry publications, the student analyses demand, supply, and the balance between them in the shipbuilding, shipbreaking, and freight markets. The students then unpacks the dynamics that shape freight market behaviour, with particular attention to chartering choices, market timing tools, asset play, and risk management. The course also offers an in depth examination of the shipbuilding, shipbreaking, and cruise markets. The student concludes the learning journey with the management of a shipping company and the role of economies of scale in vessel size.

<table>
<tr><td>Learning outcomes</td><td>- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module
1.1
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1.2
written exam</td><td>Following Module
2.1
-</td><td>Following Module
2.2
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<tr><td colspan="4">Second session
written exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Pdf’s of powerpoint presentations per topic will be made available by the course coordinator via Blackboard. This also includes a set of background academic papers and reports per topic. Furthermore, some shipping-related chapters of the online book ‘Port Economics, Management and Policy’ will be used during classes (https://porteconomicsmanagement.org/).
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>General economics
Business economics</td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**LAW OF THE SEA - BASICS (3 UC)**
Course element	**Law of the sea - basics (HZS-WE-HT-NW370)**
Lecturer(s)	**Ralph DE WIT**
Lecturer in charge	Ralph DE WIT
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	English
Required preliminary credit(s)	
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: - have acquired a basic knowledge of the international and national legal regulations governing the public law of the sea (Montego Bay Convention 1982, different zones, freedom of navigation, protection of the marine environment); - manage the relevant provisions of the Belgian Shipping Code; - have a basic knowledge of the main organisations (national, international, intergovernmental) involved in the international law of the sea.
Course content	In this course, the student is introduced to the most important concepts of international maritime law from a perspective of public law. The following elements are covered: - Introduction to international maritime law - Demarcation of the various maritime areas - Legal regime in the various maritime areas - International, European and national maritime organisations

<table>
<tr><td>Learning outcomes</td><td>- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module
1.1
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1.2
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2.1
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2.2
written exam</td></tr><tr><td colspan="4">Second session
written exam</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>General introduction to law</td></tr>
<tr><td>Additional information</td><td>- United Nations. (1982). United Nations Convention on the Law of the Sea, as amended. New-York, US: UN.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MARITIME MEDICINE (PART 2) AND TRAINING IN A HOSPITAL (4 UC)**
Course element	**Maritime medicine (part 2) and training in a hospital (HZS-WE-HT-NW341)**
Lecturer(s)	**Thomas VAN LOOY**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	**Strict succession (must have followed and passed)** Maritime medicine (Part 1)
Units of credit (UC)	4
Hours of formal lecture/practical exercise	24/12
Semester + module(s)	**Semester 1, Module 1.1** **12/8** **Semester 1, Module 1.2** **12/4** 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: - demonstrate an understanding of internal medicine as well as symptoms and treatment on board; - perform initial examinations and initiate treatment; - initiate clinical paths of care and seek assistance through radiomedical contact for evidence based medical intervention; - follow practical training in a hospital.
Course content	The student gains insight into internal medicine as well as symptoms and treatment on board, learns to perform initial examinations and start treatment. The student learns to initiate clinical paths of care and seek assistance through radiomedical contact for evidence-based medical action. After a thorough theoretical study of the main medical problems on board and learning basic actions in the medical lab, the student must follow 120 hours of practical training in a hospital.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Possess sufficient basic knowledge and skill in terms of both the social sciences (including psychology, maritime medicine) and economic and legal fields (including maritime economics, law of the sea) in order to carry out efficiently the tasks of the deck officer on board and with other maritime stakeholders. (BA-NW-8)
- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)
- Produce a well-documented written report about the research project which meets all the formal requirements of an academic publication and which is correct in terms of language and style. (BA-NW-11)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
-</td><td>Following Module 1.2
oral exam with written preparation en oral exam and permanent evaluation</td><td>Following Module 2.1
-</td><td>Following Module 2.2
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<tr><td colspan="4">Second session
oral exam with written preparation en oral exam</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first and second exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Maritime medicine (part 1)</td></tr>
<tr><td>Additional information</td><td>- Marine and Coastguard Agency. (latest ed.). The ship captain’s medical guide. London, UK: The Stationery Office.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**MARITIME ENGLISH - PART 3 (3 UC)**
Course element	**Maritime English - part 3** **(HZS-WE-HT-NW330)**
Lecturer(s)	**Pieter DECANCQ, Felix HERMANS**
Lecturer in charge	Felix HERMANS
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	Portfolio Group work
Instruction language	English
Required preliminary credit(s)	**Standard succession (must have followed)** 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: -Recognize, understand, remember and apply specific maritime vocabulary at an in-depth level in general and specific maritime communicative situations and in the context of the themes included in Maritime English 3; -Understand, apply and employ accurate English (grammar, pronunciation, structure, vocabulary, etc.) and recognize and apply language genres accordingly at maritime management level; -Understand, analyse and process a variety of maritime material in terms of the skills: reading, writing, listening and speaking; -Understand and recognise the value of self reflection and peer evaluation; -look up scientific sources, cite sources and write texts in English at an academic level; -recognize, understand, remember and use, as appropriate, the specific maritime communication system of the IMO 'Standard Marine Communication Phrases' in authentic situations.

<table>
<tr><td>Course content</td><td>In the course Maritime English 3, the student learns to

-use specific maritime English vocabulary at an in-depth level using a variety of study materials, as well as the course documents, with emphasis on certain themes relevant to students of both Nautical Sciences & Marine Engineering. These themes include effective communication, the marine environment and sustainability, green shipping and alternative fuels, material types and material processing, women in the maritime, ports of the future and the ship’s routine;

-apply accurate English (grammar, pronunciation, structure, vocabulary, etc.) at an in-depth level through use of the language at maritime management level. This involves being able to employ a range of language genres (eg. argumentative-persuasive, informative, instructive, narrative, reflective, etc.) in different maritime communicative contexts (debates, briefings, presentations, brainstorming, testimony, self-evaluation & peer evaluation, etc.).

-search for scientific sources, cite sources and write texts at academic level as part of a portfolio based on specific topics (see above)

-master the specific maritime communication system IMO Standard Marine Communication Phrases (SMCP), as appropriate, by applying the phrases in authentic situations.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
oral exam</td><td>Following Module 2.2
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<tr><td colspan="4">Second session
oral exam en portfolio</td></tr>
</table>
</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
</table>

Required study material	- Lecturer's course text available. - 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. - No calculator allowed.
Recommended preliminary competences	
Additional information	- Blakey, T.N. (2001). English for Maritime Studies (2nd ed.). Upper Saddle River, US: Prentice Hall International Ltd. - Logie, C., Vivers, E. & Nisbet, A. (1998). *Marlins English for Seafarers, Study Pack 2*. Edinburgh, UK: Marlins. ISBN: 0953174816. - MarEng partner consortium. (2007). *MarEng Web-based Maritime English Learning Tool.* https://www.utu.fi . - MarEng Plus partner consortium. (2011). *MarEng Plus Web-based Maritime English Learning Tool.* https://www.utu.fi . - Nisbet, A., Whitcher Kutz, A. & Logie, C. (1997). *Marlins English for Seafarers Study Pack 1*. Edinburgh, UK: Marlins. ISBN: 0953174808. - Van Kluijven, P.C. (2003). *The International Maritime Language Programme* (7th ed.). Alkmaar, Netherlands: Alk & Heijnen Publishers. ISBN 9789059610064. - Weeks, F., Glover, A., Johnson, E., Strevens, P., (1988). *Seaspeak Training Manual*, *Essential English for International Maritime Use*. Plymouth, U.K.: Pergamon Press. ISBN 9780080315553.

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**GENERAL AND INTERCULTURAL COMMUNICATION AND MCRM (4 UC)**
Course element	**General and Intercultural Communication (HZS-WE-HT-NW314)**
Lecturer(s)	**Sophie LIMBOS**
Lecturer in charge	Sophie LIMBOS
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Portfolio Group work
Instruction language	Dutch/French
Required preliminary credit(s)	**Strict succession (must have followed and passed)** Navigation (Part 2)
Units of credit (UC)	2
Hours of formal lecture/practical exercise	8/12
Semester + module(s)	**Semester 1, Module 1.1 4/4** | **Semester 1, Module 1.2 4/8** | 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: - have an understanding of the communication process, with particular attention to the possible pitfalls and causes of miscommunication; - apply this knowledge in the analysis of communication situations; - make a SWOT analysis of one's own communicative skills and to reflect critically on one's own competences and the perception of them by other communication partners; - formulate and apply remedial strategies; - understand, apply and adapt the acquired oral and written communication strategies to the physical and (inter)cultural context in which the communication takes place; - search for and use appropriate sources as an introduction to scientific research in order to perpare an oral intervention/presentation with correct citation of sources; - demonstrate insight into communication processes specific to on-board crisis situations, with attention to leadership, coordination, and safety; - select and apply communication strategies that support effective interaction in high-pressure or large-scale emergency settings.

<table>
<tr><td>Course content</td><td>In this course the student of Nautical Sciences learns to acquire a deeper insight into the communication process and all factors involved, both in a general as well as in a maritime context. A lot of attention is paid to the specific nature of communicative interactions (types of interactions, a professional multicultural environment) on board a ship, its impact on our way to communicate and which communication skills are required. Consequently, the student learns to analyze and refine or enhance his/her own communication skills through various written and oral activities (presentation, briefing, pitch,...).Finally, in this course, the student will master communication principles relevant to crisis contexts, as encountered in Crowd and Crisis Management on board.</td></tr>
<tr><td>Learning outcomes</td><td>- 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)
- Produce a well-documented written report about the research project which meets all the formal requirements of an academic publication and which is correct in terms of language and style. (BA-NW-11)
- Analyse personal learning needs and transform this into initiatives to undertake additional professional and academic training in nautical domains. (BA-NW-13)</td></tr>
<tr><td>Examination</td><td>
<table>
<tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
-</td><td>Following Module 2.2
-</td></tr>
<tr><td colspan="4">Second session
oral exam en portfolio</td></tr>
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</td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**GENERAL AND INTERCULTURAL COMMUNICATION AND MCRM (4 UC)**
Course element	**Maritime Crew Resource Management (MCRM) (HZS-NW-NAV-NW312)**
Lecturer(s)	**Ynse JANSSENS, Anne-Pascale MORNARD, Kathy SPEELMAN, Denis STEVENS**
Lecturer in charge	Sophie LIMBOS
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Group work
Instruction language	English
Required preliminary credit(s)	**Strict succession (must have followed and passed)** Navigation (Part 2)
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: - explain the core principles of MCRM and teamwork on board; - describe different leadership styles and the importance of emotional competence; - apply effective communication and motivation techniques within a team; - assess situational awareness; - recognize and respond appropriately to cultural differences, values, and attitudes; - identify stress, fatigue, and conflicts as safety risk factors on board; - analyze incidents based on human factors and formulate appropriate actions; - apply MCRM principles during simulator training.
Course content	The student is introduced to the fundamentals of Maritime Crew Resource Management (MCRM) and learns how human and organizational factors influence the safe and efficient functioning of a shipboard team. The course provides insight into teamwork skills, leadership, communication, and decision-making on board, with particular attention to emotional intelligence, motivation, and conflict management. The student analyzes how situational awareness, culture, values, and attitudes shape behavior on board and learns to build mental models and shared understanding within a team. They learn the importance of effective communication (such as active listening and closed-loop communication) and understand how fatigue, stress, and unexpected situations impact safety. The theory is applied through simulator training, realistic scenarios, group reflection, and structured briefings and debriefings.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Communicate correctly, effectively and professionally in English under all maritime circumstances. (BA-NW-7)
- Independently analyse complex problem situations in a professional context and develop and implement appropriate solution strategies in an international environment. (BA-NW-12)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr><tr><td colspan="4">Second session
second session impossible</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- To be able to communicate effectively, fluently and purposefully.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- CAE, MCRM student's workbook, latest edition by CAE maritime training team
- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- Lagadec, P. (1993). Preventing chaos in a crisis: Strategies for prevention, control, and damage limitation. New-York, US: McGraw-Hill. ISBN: 978-0077077747.
- Roberts, P. (1996). Watchkeeping Safety and Cargo Management in Port: A Practical Guide. London, UK: Nautical Institute. ISBN 978-1870077293.</td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**BACHELOR TERM PAPER AND SCIENTIFIC RESEARCH METHODOLOGY (5 UC)**
Course element	**Bachelor dissertation (HZS-DOC-NW399)**
Lecturer(s)	**Promotor**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Third Year Bachelor in Nautical Sciences**

Other teaching methods	
Instruction language	Dutch/French
Required preliminary credit(s)	
Units of credit (UC)	4
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: - critically evaluate information from sources and technological tools and synthesise it in combination with their own input; - set up his/her own maritime scientific research under supervision; - frame his/her work in a broader context (scientific, technological, social, or economic, etc.) and interpret its importance for the maritime sector; - report his/her work in a scientific document (thesis).
Course content	In the Bachelor Thesis the student makes an in-depth and critical study of the literature on a self-chosen theme from the Nautical Sciences. This theme is in line with the programme and/or the professional field. The literature study will lead to the formulation of a research question that will be explored in depth later on in the master's thesis. In this bachelor thesis, the student therefore already sets out how he/she will approach further research. At the end of BACH 3, the student submits the result of that work in the form of an academic report. The student shows commitment and initiative, is punctual and assertive, and keeps to agreements and timing.

<table>
<tr><td>Learning outcomes</td><td>- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)
- Produce a well-documented written report about the research project which meets all the formal requirements of an academic publication and which is correct in terms of language and style. (BA-NW-11)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
permanent evaluation with integrated practical test</td><td>Following Module 1.2
permanent evaluation with integrated practical test</td><td>Following Module 2.1
permanent evaluation with integrated practical test</td><td>Following Module 2.2
permanent evaluation with integrated practical test</td></tr><tr><td colspan="4">Second session
permanent evaluation with integrated practical test</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	**Academic Bachelor in Nautical Sciences**
Course	**BACHELOR TERM PAPER AND SCIENTIFIC RESEARCH METHODOLOGY (5 UC)**
Course element	**Methodology of scientific research (HZS-DOC-NW310)**
Lecturer(s)	**Peter BUEKEN, Camille DEBANDT, Han JACOBS, Jonas JOOS, Deirdre LUYCKX, Katrijn VERHASSELT**
Lecturer in charge	Deirdre LUYCKX
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture
Other teaching methods	
Instruction language	Dutch/French + English
Required preliminary credit(s)	
Units of credit (UC)	1
Hours of formal lecture/practical exercise	12/-
Semester + module(s)	**Semester 1, Module 1.1 4/-** | 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: - construct a scientific research question; - identify scientific sources and integrate them into a scientific study; - produce a scientific report in accordance with current scientific and academic standards; - on the basis of the chosen module, evaluate and apply scientific thinking and action in one or more of the following areas: prepare a survey or interview and process the collected data, use LaTeX to write a scientific report, work out a research design based on desired validity and reliability of the results, apply the principle of dimensional homogeneity, carry out a regression analysis, use scientific software, determine measurement deviations and their propagation.

<table>
<tr><td>Course content</td><td>In this course the student learns how to think and act academically. The student learns to correctly search for, identify, and use scientific sources of information in a scientific study. He/she then learns to edit a scientific report, focus on the correct writing style, text structure and layout, and to draw up an appropriate list of references via a software package.
In addition, the student studies one of the subjects offered as an optional module in order to deepen a certain area of scientific thinking and acting. The following sub-areas can be offered (non-exhaustive list): using the scientific word processor LaTeX, setting up a scientific experiment, obtaining valid data by means of a survey or interview, analysing research data, working out a dimensional analysis, solving problems with the help of scientific software, performing an error analysis.</td></tr>
<tr><td>Learning outcomes</td><td>- Research, evaluate and analyse scientific information related to the Nautical Sciences and correctly cite sources. (BA-NW-9)
- Formulate a complex research question within a well-defined framework; independently select and apply relevant research methods and techniques; analyse and apply the results of academic research. (BA-NW-10)
- Produce a well-documented written report about the research project which meets all the formal requirements of an academic publication and which is correct in terms of language and style. (BA-NW-11)</td></tr>
<tr><td>Examination</td><td><table>
<tr><td>Following Module 1.1
integrated practical test</td><td>Following Module 1.2
-</td><td>Following Module 2.1
-</td><td>Following Module 2.2
integrated practical test</td></tr>
<tr><td colspan="4">Second session
integrated practical test</td></tr>
</table></td></tr>
<tr><td>Caesura measures</td><td></td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.

- Ordinary scientific calculator and graphic scientific calculators allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td>Integral calculus (part 2) and statistical methods for scientific research</td></tr>
<tr><td>Additional information</td><td></td></tr>
</table>

ECTS Information Package

Antwerp Maritime Academy

Programme	Academic Bachelor in Nautical Sciences
Course	**ADVANCED FIRE FIGHTING & TANKER FIRE FIGHTING (- UC)**
Course element	**Advanced fire fighting & tanker fire fighting (HZS-NW-EXP-NW321)**
Lecturer(s)	**Laura DE WEL, Inez HOUBEN, Raf MESKENS, Dries VAN ZUNDERT**
Lecturer in charge	Inez HOUBEN
Educational programme	**Third Year Bachelor in Nautical Sciences**

Method of teaching	Formal lecture and practical exercises
Other teaching methods	Excursion Group work Demonstration
Instruction language	Dutch/French + English
Required preliminary credit(s)	
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.

<table>
<tr><td>Learning outcomes</td><td>- 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)
- Ensure safety on board and protect the marine environment, including maintaining the safety of the crew and any passengers on board (SOLAS), providing adequate resources for rescue (LSA), fire fighting (FSS) and other safety systems, organizing emergency procedures and communications (SAR, GMDSS), paying due attention to psychological and medical care, dealing with hazardous materials on board in an adequate manner (IMDG-code), being aware of marine environment issues and acting in accordance with the MARPOL convention and other international conventions relating to the pollution of the marine environment. (BA-NW-5)</td></tr>
<tr><td>Examination</td><td><table><tr><td>Following Module 1.1
permanent evaluation</td><td>Following Module 1.2
permanent evaluation</td><td>Following Module 2.1
permanent evaluation</td><td>Following Module 2.2
permanent evaluation</td></tr><tr><td colspan="4">Second session
second session impossible</td></tr></table></td></tr>
<tr><td>Caesura measures</td><td>- 100% presence in practical sessions mandatory to be evaluated in the first exam session;
- Obtain a minimum of 10/20 for each part of the exam to pass for this element.</td></tr>
<tr><td>Required study material</td><td>- Lecturer's course text available.
- Safety clothing.

- No calculator allowed.</td></tr>
<tr><td>Recommended preliminary competences</td><td></td></tr>
<tr><td>Additional information</td><td>- 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.</td></tr>
</table>

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Antwerp Maritime Academy

Required preliminary credits - summary

Academic Bachelor in Nautical Sciences

Academic year 2026-2027

Second Year Bachelor in Nautical Sciences

Nautical Faculty	
NAVIGATION (PART 2)	**Standard succession (must have followed)** NAVIGATION (PART 1) MATHEMATICS AND PHYSICS (PART 1)
REGULATIONS OF MARITIME TRAFFIC (PART 2) AND MANOEUVRES (PART 1)	**Standard succession (must have followed)** REGULATIONS OF MARITIME TRAFFIC (PART 1)
STABILITY (PART 2)	**Standard succession (must have followed)** STABILITY (PART 1)
Faculty of Sciences	
ELECTRONICS (PART 1)	**Standard succession (must have followed)** THEORY OF ELECTRICITY
THERMODYNAMICS & SHIP'S CONSTRUCTION (PART 2)	**Standard succession (must have followed)** SHIP'S CONSTRUCTION - PART 1 MATHEMATICS AND PHYSICS (PART 1)
MATHEMATICS AND PHYSICS (PART 2)	**Standard succession (must have followed)** MATHEMATICS AND PHYSICS (PART 1)
MARITIME ENGLISH - PART 2	**Standard succession (must have followed)** MARITIME ENGLISH - PART 1

Third Year Bachelor in Nautical Sciences

Nautical Faculty	
NAVIGATION (PART 3)	**Standard succession (must have followed)** MARITIME ENGLISH - PART 2 **Strict succession (must have followed and passed)** NAVIGATION (PART 2) REGULATIONS OF MARITIME TRAFFIC (PART 2) AND MANOEUVRES (PART 1)
REGULATIONS OF MARITIME TRAFFIC (PART 3) AND MANOEUVRES (PART 2)	**Strict succession (must have followed and passed)** NAVIGATION (PART 2) REGULATIONS OF MARITIME TRAFFIC (PART 2) AND MANOEUVRES (PART 1)
METEOROLOGY (PART 2) AND OCEANOGRAPHY	**Standard succession (must have followed)** METEOROLOGY (PART 1)
BASIC TANKER TRAINING (OIL, GAS, CHEM) & IGF	**Strict succession (must have followed and passed)** STABILITY (PART 2)
STABILITY (PART 3)	**Standard succession (must have followed)** STABILITY (PART 2)
Faculty of Sciences	
ELECTRONICS 2 AND INFORMATICS	**Standard succession (must have followed)** ELECTRONICS (PART 1)
PROPULSION (PART 1)	**Standard succession (must have followed)** MATHEMATICS AND PHYSICS (PART 2) THERMODYNAMICS & SHIP'S CONSTRUCTION (PART 2)
MARITIME MEDICINE (PART 2) AND TRAINING IN A HOSPITAL	**Strict succession (must have followed and passed)** MARITIME MEDICINE (PART 1)
MARITIME ENGLISH - PART 3	**Standard succession (must have followed)** MARITIME ENGLISH - PART 2
GENERAL AND INTERCULTURAL COMMUNICATION AND MCRM	**Strict succession (must have followed and passed)** NAVIGATION (PART 2)