



**Escola Superior Náutica Infante D. Henrique**  
**Department of Logistics and Transport**

# **Master of Science In Deck and Bridge Operations**

**(Syllabus)**

**ENIDH, May 2013**

F-CTC-03/0 (09/11/2011)



**Escola Superior Náutica Infante D. Henrique**  
**Department of Logistics and Transport**

## Master of Science in Deck and Bridge Operations

### 1<sup>st</sup> Year

	CH	ECTS		CH	ECTS
Ship-handling I (simulator)	3	4	Ship-handling I (simulator)	3	4
Navigational Safety I (T/P)	2	2,5	Safety of Navigation II (P)	3	4
Maritime Management (T)	4	5	Naval Architecture and Ship's Maintenance (T/P)	4	5,5
Maritime Law (T)	4	4,5	Maritime Law II (T)	4	4,5
Ship's Safety and Protection	3	4	Meteorology II (T/P)	2	2,5
Advanced Health Care II	4	4,5	Maritime Economics II (T)	3	4
Load and Carriage Systems III	2	3			
<b>Totals</b>	<b>22</b>	<b>27</b>	<b>Totals</b>	<b>19</b>	<b>24,5</b>

### CARGO AND PASSENGERS BRANCH

Load Systems and Port Organization	3	4	Crowd and Crisis Management	3	4
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### FISHERIES BRANCH

Fisheries Economics and Management	3	3,5	Oceanography and Fisheries III	5	4,5
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### TANKER SHIPS BRANCH

Liquid Cargoes Transport Systems	4	4	Chemistry - Physics and Pollution II (TP)	4	4
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### 2<sup>nd</sup> Year

Dissertation/Project/Report			<b>ECTS</b>
			60
<b>Totals</b>			<b>60</b>

#### NOTES:

CH – Contact Hours per week

TH – Tutorial orientation Hours per week

ECTS – European Credit Transfer System



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#### **MARITIME CERTIFICATION**

Applicants to Msc in “Deck-operations and Navigation ( **at Management Level**) must hold a Bsc in “Deck-operations and Navigation ( **at Operational Level**) and make evidence, through their seaman’s-book, that have got at least a 12 month on board training as per STCW/78 Convention and 1995/ Amendments, and have been issued the Certificate of Officer of the Watch.

The successful completion of the Specialization Course in Deck Office (First year of MSc course in Master of Science in Deck Operations and Navigation – 60 ECTS), meets the minimum requirements for obtaining certificates of competence for Master and Chief Officer as provided in regulation II / 2 of the 1978 STCW Convention and 1995/ Amendments.



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Master of Science in Deck and Bridge Operations			
Description of individual course unit			
Course title:	Navigation Complements		
Field:	Navigation		
Course code:	3233	Type of course:	Mandatory
From:	2011/2012		
Year of study:	1st	Semester:	1st
ECTS:	6	Hours/week:	2 hours (2 TP)
Name of lecturer:	João Carlos Gomes Frade		
Prerequisites:	No		
Objective of the course (expected learning outcomes and competences to be acquired):			
Enable students with the knowledge needed to develop the competence to determine and verify the position of the ship at sea, in the operation of search and rescue, navigation in polar waters and the determination and compensation of errors / deviations of the compass according sections A-II / 2 of STCW.			
Course contents:			
STCW	Item	Program	Hours
Tab. A - II/2	1	Astro Navigation	8
	1.1	Astronomical Position Lines.	
	1.2	The Rising and Setting of Heavenly Bodies	
	1.3	Meridian Passage and Polaris	
	1.4	Very High Altitudes (Tropical) Sights	
Tab. A - II/2	2	IAMSAR – Search and Rescue	6
	2.1	Organization and Management	
	2.2	Mission Co-Ordination	
	2.3	Mobile Facilities	
	2.4	Operation with Helicopter / Ship operation	
	2.5	The use of ECDIS in Search and Rescue	
Tab. A - II/2	3	Ice Navigation	6
B – V / g	3.1	Ice characteristics	
	3.2	Regulations and recomendations	
	3.3	The Ice Regions	
	3.4	Passage Planning in ice	
	3.5	Preparing a Ship and Crew for Ice	
	3.6	Shiphandling in Ice and use of Icebreakers	
	3.7	Limitation of the equipments	
	3.8	Safety and Emergency Procedures	
		Total	20
Tab. A - II/2	4	Emergency Navigation	4
	4.1	Action to be taken if grounding is imminent, and after grounding. Precautions when beaching a ship,	
	4.2	Action to be taken if collision is imminent and following a collision	



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	4.3	Emergency steering and Anchor.	
	4.4	Emergency towing arrangements and towing procedure	
Tab. A - II/2	5	Compass – magnetic and gyro	4
	5.1	Knowledge of the principles of magnetic and gyro-compasses	
	5.2	Ability to determine and allow for errors of the magnetic and gyro-compasses	
	5.3	Operation and care of the main types of gyro and magnetic compass.	
		Assessment	2
		<b>TOTAL</b>	<b>30</b>

### Recommended reading:

Teacher's notes.

Manual de Navegação, 4ª edição, Instituto Hidrográfico;  
 Admiralty Manual of Navigation, vol. 1, The Stationery Office;  
 Navigation Advanced for Mates/Masters, Seamanship International;  
 Navegação: A Ciência e a Arte, Altineu Pires Miguens;  
 Astronomia y Navegacion 3ª Edición, Tomo I, Tomo II, Tomo III, Moreu Curbera;  
 Astro Navigation Admiralty Manual Vol.2, The Nautical Institute;  
 Handling Ships in Ice, The Nautical Institute;  
 MANICE – Manual of Standard Procedures for Observing and Reporting Ice Conditions, Environment Canada;  
 IAMSAR, Manual, Volume I, Volume II, Volume III;  
 In Command, Captain Michael Lloyd;  
 Bridge Team Management, second edition, Captain A J Swift;  
 Bridge Procedures Guide, International Chamber of Shipping;  
 Guide to Helicopter / Ship Operations, International Chamber of Shipping;

### Teaching methods:

### Assessment methods:

1 – Elements of assessment

1.1 - The evaluation of these components is done by holding a investigation work or final examination through written test. The final exams are structurally composed of theoretical and practical questions and will last 2 hours.

1.2 - Works. Students will do individual work, and always considered a good contribution to teaching, other minor works corresponding to the specific matter. The work, follows specific rules, will be distributed at the beginning of the semester and will deliver the closing date of the last day of classes or other resulting agreement between the teacher and each of the working groups.

2 – Final exam will be exempt from the students meet all the following conditions:

- There have been rated less than 8 (eight) in the test frequency.
- Have submitted work within the established deadlines.
- Have positive information on the job.
- Have an average frequency equal to or greater than 10 (ten).

3 – Final standings

The final grade is the weighted average of the ratings of the elements of evaluation, considering, evaluating test 60%. Work and continuous assessment 40%.

**Language of instruction:** Portuguese / English



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Master of Science in Deck and Bridge Operations			
Description of individual course unit			
Course title:	Liquid Cargoes Loading and Transport Systems		
Field:			
Course code:	3248	Type of course:	Optional
From:			
Year of study:	4º	Semester:	2nd
ECTS:	5	Hours/week:	60 h
Name of lecturer:	Lázaro Delgado		
Prerequisites:			
Objective of the course (expected learning outcomes and competences to be acquired):			
To comply with the requirements of applicable Portuguese maritime legislation, namely Decree-Law Nr. 280/2001 of 23 October, as well as the requirements of the IMO (STCW 78/95, including Manila Amendments of June 2010, Table AV / 1-2-2, Section AV/1-2) applicable to Officers with responsibility for loading, unloading and transportation of liquid cargoes in all the three types of tankers: Oil, Gas and Chemical.			
Course contents:			
STCW	Item	Program	Hours
Tables	01.	Introduction	
A II/1	01.01.	Development of Tankers	
	01.02.	Oil tankers	
	01.02.01.	GP Tanker	
	01.02.02.	MR Tanker	
	01.02.03.	LR1 Tanker	
	01.02.04.	LR2 Tanker	
	01.02.05.	VLCC Tanker	
	01.02.06.	ULCC Tanker	
	01.02.07.	Combination of Tankers	
	01.03.	Types of Chemical Tankers	
	01.04.	Gas Tanker Types	
	01.04.01.	Fully Pressurized Ships	
	01.04.02.	Semi-Pressurized Ships	
	01.04.03.	Fully Refrigerated Ships	
	02.	Tanker Terminology and Definitions	
	03.	Physical Properties and Basic Chemistry of Liquid Cargoes	
	03.01.	Hidrocarbons	
	03.01.01.	Basic Chemistry	
	03.01.02.	Groups of Hidrocarbons	
	03.01.03.	Chemical Reactions	
	03.01.04.	Temperature and Pressure	
	03.01.05.	Oil Types	
	03.02.	Chemical Products	
	03.02.01.	Physical Properties of the Cargoes	
	03.02.02.	Vapour Pressure	
	03.02.03.	Flash Point	



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	03.03.	Gas	
	03.03.01.	Laws of the Gases	
	03.03.02.	Basic Refrigeration	
	03.04.	Hazards	
	04.	Cargoes Hazards	
	04.01.	Health Hazards	
	04.02.	Hazards to the Environment	
	04.03.	Reactivity Hazards	
	04.04.	Fire Hazards	
	04.04.	LEL and UEL	
	05.	Rules and Regulations	
	05.01.	National and International Rules and Regulations	
	05.02.	SOLAS	
	05.03.	MARPOL	
	05.04.	Codes of construction	
	05.04.01.	IBC	
	05.04.02.	IGC	
	05.05.	Certification and Inspection	
	06.	Tanker Design and Arrangement	
	06.01.	Construction Requirements and Equipment	
	06.02.	Ships Arrangement	
	06.03.	Pump Room	
	06.04.	Ballast	
	06.05.	Cargo Tanks Arrangement	
	06.06.	Cargo Tanks Construction	
	06.07.	Types of Ships and Survival Capability	
	06.07.01.	Oil Tankers Arrangement	
	06.07.02.	Chemical Tankers Arrangement	
	06.07.03.	Gas Tankers Arrangement	
	07.	Pumping, Piping and Discharge Arrangements	
	07.01.	Pipes and Valves	
	07.02.	Tanks Materials and Coating	
	07.03.	Cargo Tanks Venting System	
	07.04.	Cargo Pumps and Cargo System	
	07.04.01	Eductor	
	07.04.02	Centrifugal Pumps	
	07.04.03	Deepwell Pumps	
	07.04.04	Booster Pumps	
	07.04.05	Pump Theory	
	07.05.	Cargo Tanks Stripping	
	07.06.	Cargo Heating Systems	
	07.07.	Tank Cleaning and Slop-tank Operations	
	07.08.	Inert Gas Systems	
	07.09.	Refrigeration Systems	
	07.10.	Instrumentation	
	08.	Cargo Handling and Ballasting and Deballasting	
	08.01.	Loading Unloading Plan	



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	08.02.	Procedures and Preparation for Loading	
	08.03.	Use of Inert Gas on Cargo and/or Ballast Tanks	
	08.04.	Cargo Measurement and Calculation	
	08.04.01	Calculation of Maximum Volume of Cargo	
	08.04.02	Calculation using ASTM Tables	
	08.04.03	Calculation using Specific Gravity Tables	
	08.04.04	"Gassing-up" Calculation (Gas Tankers)	
	08.05.	Procedures during Loaded Voyage	
	08.06.	Measurement of the atmosphere content in the cargo tanks	
	08.07.	Cargo Heating	
	08.08.	Refrigeration Processes (Gas Tankers)	
	08.08.01	Mollier Diagram (introduction)	
	08.08.02	Refrigerating Equipments	
	08.08.03	1st Stage	
	08.08.04	2nd Stage	
	08.08.05	Cascade Reliquefaction Cycle	
	08.09.	Unloading Plan and Procedures	
	08.10.	Unloading, Stripping and Pre-Wash operations	
	08.11.	Ballasting and Deballasting	
	09.	Tank Washing Operations	
	09.01.	Tank Washing	
	09.02.	Procedures for Tank Cleaning and Discharge of Slops Tanks	
	09.03.	Cargo Tanks Gas-Freeing	
	09.04.	Cleanliness Tests	
	09.05.	COW - Crude Oil Washing	
	09.06.	Operations and Maintenance of IGS	
	10.	Safety and Environment	
	10.01.	Measurement of the atmosphere content in the cargo tanks	
	10.02.	Fire Prevention and Equipments	
	10.03.	Pollution Prevention	
	10.04.	Safety and Protection Equipment	
	11.	Emergency Operations	
	11.01.	Organizational Structures and Planning	
	11.02.	Alarms	
	11.03.	Emergency Procedures	
	11.04.	First-Aid Treatment	
	12.	Practical Lessons in the Liquefied Cargo Handling Simulator	
	13.	Assessment	
		TOTAL	
Recommended reading:			
Teaching methods:			
Assessment methods:			
Language of instruction:		Portuguese / English	





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Master of Science in Deck and Bridge Operations			
Description of individual course unit			
Course title:	Maritime Economics		
Field:	Economy and Management		
Course code:	414P	Type of course:	Mandatory
From:	2011/2012		
Year of study:	1st	Semester:	1st
ECTS:	4	Hours/week:	4 Hours
Name of lecturer:	Eduardo da Silva Martins		
Prerequisites:	--		
Objective of the course (expected learning outcomes and competences to be acquired):			
<p>It is intended to provide knowledge in the field of maritime economics, especially the issues relate to the business of shipping and port activity and multimodal transport chain, at both, international and national context.</p> <p>In parallel, to evaluate the economic position of shipping in the overall economy and identify the key trends for its development, at international and national level and assess the effects of the activity in terms of national economy.</p> <p>Will also be referred to the contribution of maritime transport to the globalization and the role reserved to the maritime transport and ports in the European transport policy.</p>			
Course contents:			
<div>1. Introduction and Objectives (6 Hours)<div>1.1. Basics and Background to the Economy</div><div>1.2. Notions of International Economics: Balance of Payments</div><div>1.3. Objectives of Maritime Economy</div></div> <div>2. Main elements that determine Maritime Transport's activity (4 hours)<div>2.1. Main features of Shipping</div><div>2.2. Main stakeholders related with the activity</div></div> <div>3. The importance of Maritime Transport in the Context of International Trade (10 hours)<div>3.1. Transport System in the Context of Economic and Maritime Transport's role</div><div>3.2. Activity by types of cargo and services</div><div>3.3. Evolution of Shipping Worldwide demand and supply</div><div>3.4. The price evolution of ships and freight rates</div><div>3.5. World developments of ship's flags</div></div> <div>4. Maritime Transport and Ports (4 hours)<div>4.1. Economic activity and economic issues in ports</div><div>4.2. Worldwide main ports</div></div> <div>5. New challenges for shipping worldwide (12 hours)<div>5.1. Introduction to shipping markets</div><div>5.2. The four markets in shipping</div><div>5.3. General principles of the analysis of demand and supply in shipping</div><div>5.4. New forms of market organization: "Pooling"</div><div>5.5. The process of business concentration: Mergers and Acquisitions</div><div>5.6. The role of maritime transport and port logistics supply chains</div></div> <div>6. Situation and outlook for activity in Portugal (4 hours)<div>6.1. The activity of shipping and shipowners in Portugal</div><div>6.2. The port activity in Portugal</div></div> <div>Written Test (2 hours)</div> <div>Presentation and discussion of Working Groups (3 hours)</div>			
Recommended reading:			



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Will be provided presentations and documentation used in class.

#### **Bibliography:**

1. Branch, Alan E. (1998), Maritime Economics: Management and Marketing, Stanley Thornes (Publishers) Ltd, London
2. Strategic Oceans Commission (2004), The Ocean: An objective for the XXI Century, Presidency of the Council of Ministers, Lisbon
3. SEAMEPAT Office (1997), Maritime-Port Policy Towards the XXI Century: White Paper, MEPAT, Lisbon
4. MOPTC - SET (2006), Strategic Guidelines for the maritime-port sector, MOPTC, Lisbon (www.moptc.pt)
5. Stopford, Martin (1997), Maritime Economics, Routledge, London
6. Nettle, Stanley (1988), Port Operations and Shipping, Lloyd's of London Pres, London

#### **Teaching methods:**

The sessions will integrate theoretical issues and the presentation of application issues related to the international shipping activity.

Will be stimulated the study of applications covering matters of greater importance in the maritime economy, in view of the fellow's work that will be presented and discussed in class sessions.

Tutoring sessions will be scheduled to monitor the study and preparation of working groups.

#### **Assessment methods:**

Continuous assessment:

- Working Group (50%);
- Written test (50%).

Approval, provided with a final continuous assessment equal to or higher than 10

Additionally, the approval in a final examination, provided that obtain a score equal to or higher than 10

#### **Language of instruction:**

Portuguese / English



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## Department of Logistics and Transport

Master of Science in Deck and Bridge Operations			
Description of individual course unit			
Course title:	Team Management and Crises		
Field:	Maritime Safety		
Course code:	3245	Type of course:	Mandatory
From:	2011/2012		
Year of study:	1st	Semester:	1st
ECTS:		Hours/week:	2
Name of lecturer:	Antonio Fera		
Prerequisites:			
Objective of the course (expected learning outcomes and competences to be acquired):			
Provide students with knowledge necessary to the functioning of organisations and human behaviour in order to contribute, as per Table A-II/2, Sections A-V/2 of STCW 2010, for an effective personnel management capacity and response to emergency situations and crises on board passenger ships and ro-ro passenger ships.			
Course contents:			
STCW	Item	Program	Hours
Tables	1	Leadership and teamwork	8
A II/2	1.1	General outline of the ship	
	1.2	Safety regulations	
	1.3	System of authority, leadership, command and team work	
	1.4	Necessary conditions to management and training staff on board	
	1.5	Planning and coordination	
	1.5	Group activities	
	1.7	Communication on board and board / land	
	1.8	Human error and safety on board	
	1.10	Difference in cultures between crew	
	1.11	Origins and causes of accidents	
Tables	2	CRISIS MANAGEMENT AND HUMAN BEHAVIOR	10
A V/2	2.1	Risk management and crisis on board of passenger ships	
	2.2	Negative factors of stress in crisis situations	
Model course 1.29	2.3	Factors affecting the decision	
	2.4	Defense systems of multi-layered	
	2.5	Emergency Plan	
	2.6	Organization of an emergency procedures	
	2.7	Safety on board and areas of intervention	
	2.8	Emergency scenarios (IMO Resolution 852)	
	2.9	Aid to the command in an emergency situation	
	2.10	Communication with passengers and use appropriately language in emergency situations	
	2.11	Use of sign language	
Tables	3	Passenger Safety	7



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A II/1	3.1	Control passengers and other people during an emergency	
	3.2	How to assist passengers in emergency situations	
	3.3	Actions to reduce accidents	
	3.4	Planning and control of rescue	
Model course 1.29	3.5	Maintenance of order	
	3.6	Optimization of resources	
	3.7	Procedures to embark and land of passengers	
	8	Analysis of accidents	3
Tables	9	Emergency exercises	2
A V/2			
			30
<b>Recommended reading:</b>			
<b>Teaching methods:</b>			
<b>Assessment methods:</b>			
<b>Language of instruction:</b>		Portuguese / English	



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## Department of Logistics and Transport

Master of Science in Deck and Bridge Operations			
Description of individual course unit			
Course title:	Loading and Carriage Systems		
Field:	Loading and Carriage Systems		
Course code:	3237	Type of course:	Mandatory
From:	2011/2013		
Year of study:	1st	Semester:	1st
ECTS:		Hours/week:	2
Name of lecturer:	António Luís Fera		
Prerequisites:			
Objective of the course (expected learning outcomes and competences to be acquired):			
Provide students with knowledge necessary to execute stowage and carriage of goods on board the different types of ships.			
In conformity to Table A II/2 of STCW: Planning and guarantee of handling, stowage, securing and care safety during the transit and during loading and discharge.			
Course contents:			
STCW	Item	Program	Hours
	1	Carriage systems	1
	1.1	Logistics of transports	0,5
	1.2	Transports chain	0,5
	2	Port and ship's equipments	1
Tab. A II/2	2.1	Technology of equipments	0,5
	2.2	Equipments maintenance	0,5
	3	Unitised cargo – Containerisation	6
	3.1	New technologies	0,5
	3.2	Special conditions of stowage	0,5
	3.3	Containers lashing	1
	3.4	Regulation -Code of Safe Praticce for cargo Stowage and Securing	0,5
	3.5	Cargo plan	1
	3.6	Stability calculations	1
	3.7	Stowage organisation	0,5
	3.8	Damages surveyors container	0,5
	3.9	Damages surveyors in ship structure – holds, cranes, ballast tanks, hatch cover and decks.	0,5
	4	Solid bulk-cargoes	19
	4.1	Documentation	1
	4.2	Characteristics of cargoes carried in bulk	1
	4.3	New technologies of bulk carriers	2
	4.4	Load and discharge gear	1
	4.5	Regulation – IBC Code	3
	4.6	Cargo plan	3
	4.7	Stability calculation and structural strength	4
	4.8	Ship and terminal communication	1
	4.9	Cargo averages surveyors	2
Tab. A II/2	4.10	Damages surveyors in the ships – holds, decks, ballast tanks and hatch covers	1



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	5	Tankers ships	3
		TOTAL	30
Recommended reading:			
Teaching methods:			
Assessment methods:			
Language of instruction:		Portuguese / English	



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## Department of Logistics and Transport

Master of Science in Deck and Bridge Operations			
Description of individual course unit			
Course title:	Loading Systems and Port Organisation		
Field:	Loading and Carriage Systems		
Course code:	3246	Type of course:	Mandatory
From:	2011/2012		
Year of study:	1st	Semester:	2nd
ECTS:		Hours/week:	3
Name of lecturer:	António Fera		
Prerequisites:			
Objective of the course (expected learning outcomes and competences to be acquired):			
Provide students with knowledge and skills to make the stowage and the carriage of water borne commodities on board the different types of ships.			
As per Table A II/2 of STCW. Planning and handling, stowing, securing, precaution during transit as well loading and discharge safe guarantee			
Course contents:			
STCW	Item	Program	Hours
	1	General and break cargo	8
	1.1	New technologies in ship's loading	0,5
	1.2	Materials and products	0,5
Table	1.3	Cargo stowage on deck	1
	1.4	Cargo lashing	2
A II/2	1.5	Cargo plan	1
	1.6	Stability calculation	1
	1.7	Code of safe Practice for cargo stowage and securing	1
	1.8	Cargo damages and surveyors	0,5
	1.9	Damages surveyors in ship structure – holds, cranes, ballast tanks, hatch cover and decks.	0,5
	2	Especial ships and Ro-Ro	9
	2.1	Ship's new technologies	0,5
	2.2	New technologies of stowing equipments	0,5
	2.3	Watertight doors, ramps, Lifting systems, Safety systems	0,5
	2.4	Ballast, deballast and draining systems	0,5
	2.5	Ventilation of cargo spaces	0,5
	2.6	Cargo stowage and securing conditions	1
	2.7	Carriage of dangerous goods	1
	2.8	Carriage of containers, cars, lorries, trailers and wagons	1
	2.9	Cargo plan	1,5
	2.10	Stability calculation and structural strength	1,
	2.11	Cargo damages surveyors	0,5
	2.12	Damages surveyors in ship structure – holds, ballast tanks, hatch cover, decks and ramps	0,5
	3	Climatology of holds- ventilators, renovation of air	4
	3.1	Ventilation system	0,5
Table	3.2	Hygroscope humidity;	0,5





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A II/2	3.3	Psychometric chart	1
	3.4	Breathing, germination and putrefaction	0,5
	3.5	Hold micro weather	1
	3.6	Damaged due to humidity in the cargo and the ship	0,5
	4	Timber carriage	3
	4.1	Timber cargo types	0,5
	4.2	Stowage and securing	0,5
	4.3	Procedures code	0,5
	4.4	Regulations	0,5
	4.5	Cargo damages surveyors	0,5
	5	Dangerous cargo	5,5
	5.1	Analysis of cargoes code (IMDGC)	0,5
	5.2	Regulation	0,5
	5.3	Stowage care	1
	5.4	Dangerous cargo securing	1
	5.5	Cargo planning	1
	5.6	Cargo damages surveyors	1
	5.7	Damages surveyors in ship structure – holds, cranes, ballast tanks, hatch cover, decks and	0,5
	6	Refrigerated cargo	3,5
	6.1	Characterization of refrigerated chambers	0,5
	6.2	New technologies in cargoes loading and stowage	0,5
	6.3	Refrigerated cargoes stowage and lashing	0,5
	6.4	Regulations	0,5
	6.5	Cargo plan	0,5
	6.6	Damages and cargo surveyors	0,5
	6.7	Refrigerates spaces damages surveyors	0,5
	7	Iron and steel and products	3
	7.1	Characteristics of cargoes	0,5
	7.2	Stowage and securing	1
	7.3	Regulations	0,5
	7.4	Cargo damages surveyors	0,5
	7.5	Damages surveyors in ship structure – holds, cranes, ballast tanks, hatch cover, decks and	0,5
	8	Heavy cargo	3
	8.1	Stowage and lashing	2
	8.2	Cargo damage surveyors	0,5
	8.3	Damages surveyors in ship structure – holds, cranes, ballast tanks, hatch cover, decks and	0,5
	9	Port organisation	5
	9.1	Terminals characterisations	2
	9.2	Organic structure	1
	9.3	Organization and load and discharge operations planning	1
	9.4	Productivity of port operations	1
		Total	45

**Recommended reading:**

**Teaching methods:**

**Assessment methods:**

**Language of instruction:** Portuguese / English