Syllabi

for

The Bachelor of
Technology Management and Marine Engineering

(The Marine Engineer Training Programme)

Version 6.10, 1 February 2022

Overview of syllabi:

No.	Subject area	BM1	BM2	BM3	BM4	BM5	BM6	BM7	BM8	BM9
20100	Workshop Training (BM)	X	X							
20200	Internship (BM)		X	X						X
20201	On Board Training (BM)		X	X						X
20300	Thermal Machinery and Systems (BM)				X	X	X	X	X	
20400	Electrical and Electronic Machinery and Systems (BM)				X	X	X	X		
20500	Process Analysis and Automation (BM)					X	X		X	
20600	Management (BM)				X		X	X	X	
20700	Interdisciplinary Elements and Methodology (BM)				X				X	X
20800	Elective Subjects (BM)					X			X	

BM – Subject Syllabus

Subject area:	20100	**Workshop Training (BM)**		
Subject(s):		Introduction and First Aid Courses	BM1	
	20111	Welding and Material Understanding	BM1	5 ECTS
	20112	Machining and technical drawing	BM1	5 ECTS
	20113	Electrical and Electronic Machinery	BM1	5 ECTS
	20114	Thermal Machinery and Systems	BM1	5 ECTS
	20115	Interdisciplinary module	BM1	10 ECTS
	20121	Workshop Project	BM2	15 ECTS
Admission criteria:	Workshop Project	Passed all other subjects in BM1.		
Semester:	BM1 & BM2			
ECTS credits:	30 & 15			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programme – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended. • Order on measures for prevention of cancer risk by working with substances and materials (§17 course) – Danish order no 1795 of 18 December 2016, as amended.			
STCW:	*STCW Code, as amended: Part A, chapter VI - Emergency, safety, security:* Section A-VI/1, paragraph 2 • Elementary first aid as set in table A-VI/1-3			
Certificate(s):	*Certificate of Safety and Health Training in Welding and Thermal Cutting* is issued upon completion of the training programme prescribed in the Danish order on measures for prevention of cancer risk by working with substances and materials – Danish order no. 1795 of 18 December 2015, as amended - (paragraph 17 training programme).			
Qualification prerequisites for professors/instructors etc.	Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted. Instructors of Elementary First Aid courses shall have completed a training programme for teachers of First Aid approved by the Danish First Aid Council.			
Core literature				
Responsible:	Subject Manager			

Valid from:	2022-1	EIN
Expired:		
Remarks:	None	

Purpose — BM

The student must completed a professional training and education to obtain the craftsman's skills that are necessary for an engineer, so the student can independently collaboration with other, apply these skills both in planning and in execution of their craft including electro-technical maintenance and repair. The performed tasks shall take into account environmental and safety regulations. The student shall develop his/her understanding and insight in the relevant workmanship for an engineer, as well as the ability to assess the quality of the work performed. The student must gain an understanding of general occupational safety and environmental issues, as well as the use of personal protective equipment. During this Subject, the students will be presented with various oral and written assignments, the purpose of which is to enhance their knowledge and understanding of technical and maritime English.

Introduction and First Aid Courses — BM1

Content:

The Introduction course introduces the program. Furthermore, the course will introduce study techniques and SIMAC specific educational learning platforms.
The first aid course gives the student the competencies to administer first aid.

Learning objectives:

- To **use** SIMAC's educational support platforms such as Moodle, Untis and Wiseflow etc.
- To **list** the content and structure of the program including subject syllabi and curriculum.
- To **understand** study techniques for further use in the program.
- To **demonstrate** the competences of Elementary first aid.
- To **demonstrate** the competences of Working environment and safety during welding and thermal cutting - Danish order no. 1795 of 18 December 2015, as amended - (paragraph 17 training programme).

Learning activities:

- **Situation:** Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials, and student activity.
- **Student centered activities:** The student-centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz groups, learning cells, etc.

Welding and material understanding	BM1

Content:

The student can select the most suitable welding methods based on a given material. Can perform simple welds, as well as soldering in a safe manner. Have a basic understanding of materials for heat generation, as well as corrosion protection. Can perform technical documentation and organize simple tasks within Welding.

Learning objectives:

After completion of this subject, the student will be able to:

- demonstrate the use of welders in a safe manner, as well as handling the use of compressed gases.
- explain the function, as well as use MMA, TIG, MIG / MAG and soldering techniques.
- have knowledge of suitable joining methods, including different types of welders, for different materials and tasks.
- explain how the composition, heat treatment and surface treatment of the material affect its resistance to external influences
- have knowledge of non-destructive and destructive material testing and material control

Learning activities:

- Theory in classrooms or online on Teams, group work, self-study, and practical assignments in the workshop and document portfolio.

Machining and technical drawing	BM1

Content:

Safety when working with rotating tools. The construction and the safe use of the lathe and the milling machine. Operate a lathe in a safe manner. Calculation of the rotating speed of a rotating tool. Tolerances and other quality measures used in manufacturing, repairing and maintenance. Be familiar with general regulations for drawings and general drawing entries (goal, tolerances, edges, texture, etc.) in order to understand mechanical engineering drawings and be able to produce simple Production drawings. Sharpen cutting tools. Plan smaller tasks. Manufacture and repair items on the lathe.

Learning objectives:

After completion of this subject, the student will be able to:

- explain the function, as well as be able to use lathes, milling machines, drills, and rotating tools.
- demonstrate the use of lathes, milling cutters, drills, and rotating tools in a safe manner, as well as select the correct personal protective equipment.
- select, demonstrate and use the use of correct measuring tools
- construct simple 3D models in CAD program, as well as prepare technical documentation according to Dansk Standard
- judge the craftsmanship quality of work done in machining

Learning activities:

- Theory / classroom teaching within subjects
- Practical work in workshop, make items with progression in difficulty
- Independent work, create documentation portfolio
- Group work, make group product, pump stand / motor

Electrical and Electronic Machinery	BM1

Content:

Learning objectives:

After completion of this subject, the student will be able to:

- explain and exemplify principles for equipment used in power generating equipment, transmission, and electricity consumers, for example lighting, heating, electric motors etc.
- explain and exemplify electrotecnical documentation published in English
- demonstrate minor electrotechnical estimates
- assess the safety culture concerning the construction and operation of electrical installations and facilities
- participate in the daily operation and maintenance of ship and industrial electrical installations as an intern

Learning activities:

- **Situation:** Large Class:
  Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
- **Student-centred activity:** (SCA)
  SCA is primarily theoretical problem solving in study groups and work experiences in the workshops

Thermal Machinery and Systems | BM1

Content:

Use appropriate hand tools for repairs and maintenance on engines. Understand general technical documentation, in the form of PI-diagrams that can be found on a ship. Understand how proper tightening is performed to the correct specified torque. Construction and operation of various types of diesel engines and their main components. The various auxiliary systems found on a merchant vessel, including boilers, air compressors, pumps, and air conditioning units. Know the importance of filtration and filter technology i hydraulics. Being able to assist in minor repairs and maintenance in hydraulic power systems.

Learning objectives:

After completion of this subject, the student will be able to:

- identify all main components of 2- and 4-stroke engines, as well as explain the function of these.
- undertake a safe start-up on a smaller marine diesel engine and hydraulic systems.
- build and assemble a simple hydraulic system, and be able to account for the operation and function of the individual components.
- flush a hydraulic system, as well as be able to explain the importance of cleaning and filtration in hydraulic systems.
- read and understand PI diagrams, including auxiliary systems for internal combustion engines and boiler systems as well as symbol reading for hydraulics.

Learning activities:

- Through interdisciplinary case with EEM, as well as theoretical assignments. Practical exercises / tasks in the workshop for disassembly and assembly of engines
- Each individual student must be able to undertake a safe start-up of the 5 cyl. As well as associated auxiliary systems. Hydraulics: Perform risk assessment on the lab equipment and exercises before commencing.
- Group-based assignments in the laboratory, as well as theoretical introduction
- By performing the described learning activities practically in the workshop

Interdisciplinary module	BM1

Content:

Develop skills in collaboration around an interdisciplinary project that goes across the individual modules on BM1. Gain knowledge of project planning.

Learning objectives:

After completion of this subject, the student will be able to:

- demonstrate understanding of and implement planning of interdisciplinary project in collaboration with other students
- demonstrate safe behavior in the workshop across disciplines
- manufacture functional sub-components, based on relevant data sheets, cf. Dansk Standard.
- demonstrate correct assembly, as well as the use of interdisciplinary assignment in collaboration with study group.
- perform technical documentation of interdisciplinary project.

Learning activities:

- Work in study groups, portfolio and practical work in workshop.

Examination	BM1
Examination name:	Workshop Training
Examination type:	Portfolio Internal oral test Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	Portfolio with four topics
Important information:	At the examination, the student presents his/her portfolio with focus on either the ▪ Welding and material understanding, ▪ Machining and technical drawing, ▪ Electrical and Electronic Machinery or ▪ Thermal Machinery and Systems aspects. Each student is randomly assigned their focus by the Student Services and the student is informed of focus at the start of examination. The portfolio presentation should have a duration of about 10 minutes. The remainder of the time is for cross-examination of the assigned portfolio focus. The student will receive one grade based upon the student's presentation and performance at the exam. The portfolio must include a summary written in English. The maximum scope of the total portfolio is 40 pages as per SIMAC norm.
Prerequisites for examination:	Counting activities in the Welding and material understanding, Machining and technical drawing, Electrical and Electronic Machinery and Thermal Machinery and Systems are completed Description of counting activities and requirements for completion are described in the lesson plan.

Workshop Project — BM2

Content:

Learning objectives:

Knowledge:

- The innovation process, including idea-generation, and based on the integration of the different skills taught in semester 1, together with possible new ways of solving problems.
- Construction techniques, manufacture and troubleshooting, going further than the knowledge you acquired during semester 1.

Skills:

- Realize the idea of the project and present the plan with special consideration for valid and useful perspectives.
- Carry out more complex craftsmanship and skills, than learnt during semester 1.
- Carry out the work independently, including the appropriate choice of method, specially adapted to the specific and changing problems presented by the project.

Competencies:

- Carry out simple project management, under guidance (from the instructors), of your own clearly defined uncomplicated project, with the starting point of well worked out and concrete ideas.
- Be able to plan, organize, and understand the realization of a simple concrete project based on appropriate construction techniques and safety aspects.

Learning activities:

Examination:

Examination name:	Workshop Project
Examination type:	Ongoing assessment Individual
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	None
Prerequisites for examination:	None

Syllabus

Subject area:	**20200**	**Internship (BM)**		
Subject(s):	20221	Internship BM2	BM2	15 ECTS
	20231	Internship BM3	BM3	30 ECTS
	20291	Internship BM9	BM9	15 ECTS
Admission criteria:	Internship BM2 & BM3	The BM student must have passed all subjects in the first semester BM1 and the workshop project in BM2 in accordance with the course regulations for Marine Engineer as well as signed an internship agreement.		
	Internship BM9	The BM student must have passed all subjects in accordance with the course regulations for Marine Engineer, except the bachelor project as well as signed a internship agreement.		
Semester:	BM2 + BM3 + BM9			
ECTS credits:	60			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional Bachelor Training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programme – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended. • Order on training programme and refresher training programme for safety at sea and firefighting on board ships – Danish order no 226 of 2 March 2015, as amended. • Order on training programme and refresher training programme in operation of fast rescue boats - order no 658 of 12 May 2015, as amended. • Order on training programme for Tanker Operations – Danish order no 1165 2 November 2014, as amended. • Order on training programme for operation of survival craft and rescue boat other than fast rescue boats – Danish order no 1207 23 October 2015, as amended. • Order on training programme in Maritime Security of Ships - order no 1279 of 7 November 2013, as amended.			
STCW:				
Certificate(s):				
Qualification prerequisites for professors/instructors etc.	Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and			

	• have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.	
Core literature		
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:		
Duration of internship	• The duration of the internship BM2 & BM3, equalling 45 ECTS credits, is considered fulfilled when the effective internship time amounts to 30 weeks • The duration of the internship BM9, equalling 15 ECTS credits, is considered fulfilled when the effective internship time amounts to 10 weeks. • The internship BM9 cannot be replaced by another internship time or merit from another education.	

Purpose

BM

Internship:

The internship in BM2 & BM3 is meant to give the student experience with the practical application of the artisan skills in a business environment. Furthermore, the goal is to be able to participate in a company organization with focus on communication, safety and collaboration.
The internship in BM9 shall teach the student to work in a development-oriented and problem solving way with the profession as Maritime Engineer. The student will draw links between experiences and theoretical knowledge here by being able to identify and analyze subjects, fields and problems that are central in relation to the profession as Maritime Engineer.
The internship shall lead to the exchange of knowledge, skills and values between education and profession/industry and establishment of a network.

Internship BM2 & BM3	BM2 & BM3

Content:

Learning objectives:

Knowledge:

- Company organization with focus on communication, safety and cooperation

Skills:

- apply the skills learned at the training school in a business environment
- conduct work safety and environmental considerations correctly

Competencies:

- communicate and collaborate in a business environment
- utilize the most appropriate work method considering quality, time, material, safety and environment

Learning activities:

Examination:

Examination name:	Internship BM2 & Internship BM3
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	The internshio supervisor supervises and ensures that the formal requirements in the logbook are followed. If there is uncertainty or disagreements, the subject is investigated by the Vice President (Academics) in collaboration with the student's internship company. Ultimately the decision which initiative needs to be further applied to receive the grading given is decided by the Vice President (Academics).
Prerequisites for examination:	None

Internship BM9 | BM9

Content:

Learning objectives:

Knowledge:

- the Maritime Engineers ordinary administrative routines
- the theory underlying the areas that the maritime engineer at the internship company deals with
- practical selection and application of tools and measuring equipment
- the typical ways of communication in a company

Skills:

- handle practical situations occurring in the daily work
- apply the theory learned through the lessons
- deal with a selection of problems with a possible interdisciplinary background

Competencies:

- plan and complete smaller tasks belonging to the internship company's field of action
- participate in the ordinary administrative routines occurring at the internship company
- work in an interdisciplinary way with subjects belonging to the maritime engineering education
- work in a development-oriented manner

Learning activities:

Examination:

Examination name:	Internship BM9
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	The internship is evaluated in collaboration with SIMAC's internship supervisor and one of the contact persons/supervisors from the internship company. If there is uncertainty or disagreements, the subject is investigated by the Vice President (Academics) in collaboration with internship company supervisor/contact person. Ultimately the decision which initiatives need to be further applied to receive the grading given is decided by the Vice President (Academics)
Prerequisites for examination:	None

Syllabus

Subject area:	**20201**	**On Board Training (BM)**		
Subject(s):	20222	On Board Training BM2	BM2	15 ECTS
	20232	On Board Training BM3	BM3	30 ECTS
	20292	On Board Training BM9	BM9	15 ECTS
		Safety Training – BM2(SØ)		
	20223	Safety at Sea	BM2(SØ)	
	20224	Basic Fire Fighting Theory	BM2(SØ)	
	20225	Basic Fire Fighting Course		
	20226	Maritime Law	BM2(SØ)	
	20227	Designated Security Duties		
	20228	Basic Training for Oil, Chemical & Gas Tanker	BM2(SØ)	
Admission criteria:				
	On Board Training BM2 & BM3	The BM student must have passed all subjects in the first semester BM1 and the workshop project in BM2 in accordance to the course regulations for Marine Engineer as well as signed a On Board Training agreement. All Subjects in Safety Training must be passed before service at sea		
	On Board Training BM9	The BM student must have passed all subjects in accordance to the course regulations for Marine Engineer, except the bachelor project as well as signed an On Board Training agreement. All subjects in safety training must be passed before service at sea		
	Basic Fire Fighting Course:	A valid medical certificate for seafarers. Passed Basic Fire Fighting Theory.		
Semester:	BM2 + BM3 + BM9			
ECTS credits:	60			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional Bachelor Training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programme – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended. • Order on training programme and refresher training programme for safety at sea and firefighting on board ships – Danish order no 226 of 2 March 2015, as amended.			

	• Order on training programme for Tanker Operations – Danish order no 1165 2 November 2014, as amended. • Order on training programme for operation of survival craft and rescue boat other than fast rescue boats – Danish order no 1207 23 October 2015, as amended. • Order on training programme in Maritime Security of Ships - order no 1279 of 7 November 2013, as amended.
STCW:	*STCW Code, as amended: Part A, chapter III - Engine department* Section A-III/4 • Marine engineering at the support level as set in table A-III/4 *STCW Code, as amended: Part A, chapter VI - Emergency, safety, security:* Section A-VI/1, paragraph 2 • Personal survival techniques as set in table A-VI/1-1 • Fire prevention and fire-fighting as set in table A-VI/1-2 • Elementary first aid as set in table A-VI/1-3 • Personal safety and social responsibilities as set in table A-VI/1-4 Section A-VI/2, paragraph 1 to 12 • Proficiency in survival craft and rescue boats other than fast rescue boats as set in table A-VI/2-1. Section A-VI/6, paragraph 6 to 8 • Designated Security Duties as set in tablet A-VI/6-2 *STCW Code, as amended: Part A, chapter V - Special training requirements:* Section A-V/1-1-1 • Basic training for oil and chemical tanker as set in table A-V/1-1-1. Section A-V/1-2-1 • Basic training for gas tanker as set in table A-V/1-2-1
Certificate(s):	*Certificate of Proficiency Basic Safety Training* is issued upon completion of the training programme prescribed in Regulation VI/1 and STCW Code; section A-VI/2 of the STCW Convention of 1978, as amended. *Certificate of Proficiency for Designated Security Duties* is issued upon completion of the specialized training programme prescribed in Regulation VI/6, paragraph 4 to 6 of the STCW Convention of 1978, as amended and the Danish order no 1279 of 7 November 2013, as amended. *Course Certificate of Basic Training for Oil, Chemical and Gas Tanker Cargo Operations* is issued upon completion of the training programme prescribed in Regulation V/1-1, paragraph 2.2 and Regulation V/1-2, paragraph 2.2 of the STCW Convention of 1978, as amended and the Danish order no 1165 2 November 2014, as amended. (”Carry out fire-fighting operations” as set in table A-V/1-1-1 and 1-2-1 of STCW Convention of 1978, as amended) *Course Certificate in survival craft and rescue boat other than fast rescue boats* is issued upon completed the training programme prescribed in Regulation VI/2, paragraph 1.3 of the STCW Convention of 1978, as amended and the Danish order no 1207 23 October 2015, as amended. *Certificate of Proficiency in survival craft and rescue boat other than fast rescue boats* is issued upon completion of at least 6 months relevant seagoing service is proved and completed the training programme prescribed in Regulation VI/2, paragraph 1 of the

	STCW Convention of 1978, as amended and the Danish order no 1207 23 October 2015, as amended.	
Qualification prerequisites for professors/instructors etc.	Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.	
Core literature		
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	12 months = 365 calendar days 6 months = 183 calendar days 4½ months = 137 calendar days	3 months = 91 calendar days 2 months = 61 calendar days
Duration of On Board Training:	• The duration of the On Board Training BM2 & BM3, equalling 45 ECTS credits, is considered fulfilled when the effective service at sea amounts to a minimum of 6 months (183 calendar days). • The duration of the On Board Training BM9, equalling 15 ECTS credits, is considered fulfilled when the effective service at sea amounts to a minimum of 50 calendar days. • The On Board Training BM9 cannot be replaced by another service at sea or merit from another education. • Earned service at sea in ferries must be documented by showing a service at sea certificate. If this is not possible, the service at sea will count for 50%.	
Change of study program from BJ to BM:	• By change of program from BJ to BM education, the student can transfer earned service at sea from the On Board Training BJ2 & BJ6 in the relation 1:1, though a maximum of 3 months (91 calendar days) of service at sea can be transferred. • From the On Board Training BJ2, BJ6 & BJ7 the student can get 50% of the earned service at sea transferred to the On Board Training in the BM education. • The total transfer from the On Board Training in BM education cannot exceed 6 (183 calendar days) months efficient service at sea • If a change of study causes an inconvenient study program, the student can apply for dispensation and get a part of the On Board Training postponed. However, the service at sea must at minimum be 4 months and 15 days (137 calendar days) in the On Board Training in BM2 & BM3 • The approved Training Record Book from the On Board Training in the BJ education is replaced with the green Training Record Book for Marine Engineers	

Change of study program from BS to BM:	• By change of program from BS to BM education, the student can transfer earned service at sea from the On Board Training in BS2 in the relation 1:1, though a maximum of 3 months (91 calendar days) of service at sea can be transferred to the On Board Training in the BM education. If a change of study causes an inconvenient study program, the student can apply for dispensation and get a part of the On Board Training postponed. However, the service at sea must at minimum be 4 months and 15 days (137 calendar days) in the On Board Training. • The approved Training Record Book from the On Board Training in the BS education is replaced with the green Training Record Book for Marine Engineers

Purpose	BM (SØ)

On Board Training:

The On Board Training in BM2 & BM3 will give the student experience with the application of practical skills used on a ship. Furthermore, the goal is to be able to participate in ship organization with a focus on communication, safety and collaboration. The student must at minimum have completed 6 months of engine room service supervised by a Maritime Engineer or a qualified officer in accordance with STCW convention – regulation III/1. Engine room service should be organized such that the student gets the opportunity to stand watch by canal passages, sailing in trafficked waters and under maneuver. Emphasis must be put on understanding the necessity of following good discipline on the bridge and in the engine room, see STCW convention chapter VIII.

The On Board Training BM9 shall teach the student to work in a development-oriented and problem solving way as a professional Maritime Engineer. The student will draw links between experiences and theoretical knowledge here by being able to identify and analyze subjects, fields and problems that are central in relation to the profession as Maritime Engineer.
The internship shall lead to the exchange of knowledge, skills and values between education and profession/industry and the establishment of a network.

On Board Training BM2 & BM3	BM2(SØ) & BM3(SØ)

Content:

Learning objectives:

Knowledge:

- The cooperation within the ships organization under different operational situations, focusing on communication and safety awareness.
- Routines in relation to engineering operations and teamwork with other working groups on board.
- Purpose and general understanding of different types of technical systems on board ships.
- Decision making processes in relation to engineering operations under consideration of quality, materials, time, work and environmental safety

Skills:

- Apply and reflect upon the knowledge attained through the Workshop Training, safety and Seamanship course in correlation to practical tasks within a ships organization.
- Operate different technical systems under consideration to different operational conditions and safety awareness

Competencies:

- Communicate and cooperate on board a ship

Learning activities:

Examination:

Examination name:	On Board Training BM2 & On Board Training BM3

Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	The study administration supervises and ensures that the formal requirements in the Training Record Book are followed. If there is uncertainty or disagreements, the subject is investigated by the Vice President (Academics) in collaboration with the student's shipping company. Ultimately the decision which initiative needs to be further applied to receive the grading given is decided by the Vice President (Academics). The student must also show documentation for the achieved service at sea, which must be approved by the study administration.
Prerequisites for examination:	None

On Board Training BM9 | BM9(SØ)

Content:

Learning objectives:

Knowledge:

- The Engineers tasks in connection to a ships administrative operations, under consideration to conventions and legislations.
- Use of administrative tools and document control in connection to Engine room management

Skills:

- Plan and conduct different work routines in the engine room under consideration to maintenance and optimization, taking into consideration personal and environmental safety.
- Apply and reflect upon the knowledge attained through the previous theoretical semesters and put it to use within the ships organization.

Competencies:

- Be part of an Engine Watch and have Watch duty responsibilities cf. STCW convention regulation III/1
- Plan and supervise operational work routines in correlation with ship operations, considering the environment, crew and ship safety.
- Conduct administrative duties
- Work in a development-oriented manner in order to optimize the operation the technical systems onboard.

Learning activities:

Examination:

Examination name:	On Board Training BM9
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	The study administration supervises and ensures that the formal requirements in the Training Record Book are followed. If there is uncertainty or disagreements, the subject is investigated by the Vice President (Academics) in collaboration with the student's shipping company. Ultimately the decision which initiative needs to be further applied to receive the grading given is decided by the Vice President (Academics). The student must show documentation for the achieved service at sea after sailing, which must be approved by the study administration.
Prerequisites for examination:	None

Safety at Sea | BM2(SØ)

Content:

Learning objectives:

Knowledge:

- Construction and outfit of survival craft and rescue boats, individual items of their equipment and characteristics.
- Methods of, and safety precautions of launching survival craft and rescue boat including in rough seas
- Methods of recovering survival craft and rescue boats
- Dangers associated with on-load release devices
- Maintenance procedures in relation to boats, launching- and recovery gear.
- Operating winch, brakes, falls, painters and other equipment commonly fitted
- The precautions, in the case of "man overboard" and "fire" or "lifeboat" alarm.
- General sea survival requirements, the practical use of personal survival equipment and group survival equipment available on board.

Skills:

- Right an inverted life raft while wearing a lifejacket or survival suit
- Prepare and safely launch survival craft using both on-load and off-load release devices
- Safely recover survival craft and rescue boats, including proper resetting of both on-load and off-load release devices
- Understand and use the necessary orders and tasks in English for safe evacuation

Competencies:

- Take change of a survival craft or rescue boat during and after a launch.
- Manage survival craft after abandoning ship.
- Use appropriate GMDSS equipment including signaling apparatus and pyrotechnics.
- Operate the engine of survival craft and rescue boats.
- Distinguish between the alarm signals used in commercial vessels and explain the structure and use of a merchant ship safety plan and be able to demonstrate proper behavior according to the ships muster list.
- Use and understand the rescue means available on board properly and enter water from a certain height
- Stay fluent without buoyancy

Learning activities:

Examination:

Examination name:	Safety at Sea
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None

Duration:	N/A
Aids allowed:	N/A
Important information:	None
Prerequisites for examination:	None

Basic Fire Fighting Theory: BM2(SØ)

Content:

Learning objectives:

Knowledge:

- Shipboard fire-fighting organization
- Fire and smoke detection and automatic alarm systems
- The need for constant vigilance

Skills:

Competencies:

- Minimize the risk of fire and maintain a state of readiness to respond to emergency situations involving fire.

Learning activities:

Examination:

Examination name:	Basic Fire Fighting Theory
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	None
Prerequisites for examination:	None

Basic Fire Fighting Course:	BM2(SØ)

Content:

Learning objectives:

Knowledge:

- Flammable materials, fire hazards and spread of fire
- Location of firefighting appliances and emergency escape routes
- Types and sources of ignition
- The elements of fire and explosion (the fire triangle)
- Actions to be taken on board ship
- Classification of fire and applicable extinguishing agents
- Fire-fighting equipment and its location on board
- Instruction in:
  - Fixed installations
  - Fire-fighter's outfits
  - Personal equipment
  - Fire-fighting appliances and equipment
  - Fire-fighting methods
  - Fire-fighting agents
  - Fire-fighting procedures
  - Use of breathing apparatus for fighting fires and effecting rescues

Skills:

- None.

Competencies:

- Fight and extinguish fire.

Learning activities:

Examination:

Examination name:	Basic Fire Fighting Course
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	None
Prerequisites for examination:	None

Maritime Law: BM2(SØ)

Content:

Learning objectives:

Knowledge:

- of his/her rights and obligations according to The Seamen's Act.

Skills:

- None

Competencies:

- None

Learning activities:

Examination:

Examination name:	Maritime Law
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	None
Prerequisites for examination:	None

Designated Security Duties (DSD): BM2(SØ)

Content:

Learning objectives:

Knowledge:

- Knowledge of current security threats and patterns;
- Recognition, on a non-discriminatory basis, of characteristics and behavioral patterns of persons who are likely to threaten security;
- Techniques used to circumvent security measures;
- Security related communications;
- Knowledge of emergency procedures and contingency plans;

Skills:

- Recognize and detect weapons, dangerous substances and devices.
- Manage crowds and crowd control techniques.
- Test, calibrate and at-sea maintenance of security equipment and systems.
- Inspect, control, and monitoring techniques.
- Operate security equipment and systems.

Competencies:

- Physically search persons, personal effects, and baggage, cargo, and ship stores.

Learning activities:

Examination:

Examination name:	Designated Security Duties (DSD)
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	None
Prerequisites for examination:	None

Basic Training for Oil, Chemical and Gas Tanker: BM2(SØ)

Content:

Learning objectives:

Knowledge:

- Types of oil, chemical and liquefied gas tankers, their equipment and operation
  - Piping systems and valves
  - Cargo pumps
  - Loading and unloading
  - Tank cleaning, purging, gas-freeing and inerting
- Cargos and properties
  - Pressure and temperature, including vapour pressure/temperature relationship
  - Types of electrostatic charge generation
  - Chemical symbols
  - ESD
- Safety culture and management
- Operational cargo hazards and how they are controlled
  - Health hazards
  - Environmental hazards
  - Corrosive hazards
  - Explosive and flammability hazards
  - Sources of ignition, including electrostatic hazards
  - Toxicity hazards
  - Vapour leaks and clouds
  - Extremely low temperatures
  - Pressure hazards
  - Inerting, water padding, drying agents and monitoring techniques
  - Anti-static measures
  - Ventilation
  - Segregation
  - Cargo inhibition
  - Importance of cargo compatibility
  - Atmospheric control
- Contents and purpose of a MSDS
- Safety equipment and PPE
  - Breathing apparatus and tank-evacuating equipment
  - Resuscitators
  - Rescue and escape equipment
- Gas-measuring equipment
- Safe operation of the vessel
- Safe working practices incl. legislation and guidelines
  - Precautions to be taken when entering enclosed spaces
  - Precautions to be taken before and during repair and maintenance work
  - Safety measures for hot and cold work
  - Electrical safety

- Ship/shore safety check list
- Emergency action in case of injury, fire or spill
  - Reporting to responsible persons
  - SOPEP
  - Prevention of brittle fractures

Skills:

- Identify and take precautions to prevent hazards
- Apply occupational health and safety precautions and measures
- Take precautions to avoid pollution from cargo

Competencies:

- Contribute to safe operation of tankers

Learning activities:

Examination:

Examination name:	Basic Training for Oil, Chemical and Gas Tanker
Examination type:	Ongoing assessment
Grade scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important information:	None
Prerequisites for examination:	None

BM – Subject Syllabus

Subject area:	**20300**	**Thermal Machinery and Systems (BM)**		
Subject(s):	20341	Thermal Machinery I	BM4	10 ECTS
	20351	Thermal Machinery II	BM5	10 ECTS
	20361	Thermal Machinery III	BM6	10 ECTS
	20371	Thermal Machinery IV	BM7	5 ECTS
	20381	Thermal Machinery V	BM8	5 ECTS
Admission criteria:				
Semester:	BM4 + BM5 + BM6 + BM7 + BM8			
ECTS credits:	40 ECTS			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.			
STCW:	*STCW Code, as amended: Part A, chapter III - Engine department:* Section A-III/1 – Operational level. Section A-III/2 – Management level.			
Qualification prerequisites for professors/instructors etc.	Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.			
Core literature				
Certificate(s):	None			
Responsible:	Subject Manager			
Valid from:	2022-1	EIN		
Expired:				
Remarks:				

Purpose — BM

Thermal machinery and systems are specialized themes in the work as a marine engineer. The subjects in the field of thermal plants and machinery should enable the student to perform the operation and maintenance of engines, steam boilers, combustion and cooling equipment, environmental facilities and associated systems, in order to make these systems work reliably, economically, and optimally without danger, and without causing damage to the environment.
The student achieves knowledge and skills concerning water treatment, fuels and combustion gas control.

Finally, the student acquires knowledge and skills concerning the effects of the residues and contamination products from households, transport, construction, ship plants and industrial process plants on the environment.

Thermal Machinery I — BM4

Content:

The overall scope of TMA I is to enable the student to operate different marine thermal systems such as combustion engines, steam plants and cooling plants.

Learning objectives:

On completion of this subject, students must be able to:

Knowledge:

- Present proper terminology, define terms and recall function, construction and properties of the main thermal energy machinery and systems in marine engine rooms.
- Recall the principles of operation and adjustment of the main thermal energy systems in the engine room such as cooling plants, steam and boilers, engines and the relevant auxiliary systems.
- Present the theoretical circuit process-cooling and steam systems with evaporation and condensation, including enthalpies for liquid, saturated steam and superheated steam.
- List the various static and dynamic load types and their impact on materials, including how external forces and degrees of torque affect the stress within the material.

Skills:

- Identify relevant data in thermal energy systems and perform basic calculations of heat and energy balances and consumption.
- Operate marine thermal energy systems taking personal safety, operational safety and environmental safety into account.
- Explain basic terms of maintenance in thermal energy systems and components, including the main material test methods, destructive.
- Demonstrate application of relevant documentation and diagrams, monitoring equipment and instrumentation in thermal energy systems.

Competencies:

- Communicate and present information effective orally in a collaborative environment
- Operate marine thermal energy systems, supervise the operational mode and act upon abnormal operation

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials and student activity.
- Situation: Laboratory. The lab exercise is designed to supplement the learning objectives
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz qroups, learning cells, etc.. For student centered activities the instructor(s) are available for tutoring, professional guidance, and formative feedback.
    - Workplace:
      Learning by utilizing engine room simulators.
    - Portfolio:
      The portfolio is the student's reflection on how the learning objectives are reached and is a compilation of theory, workplace practice and context. Some core topics of the subject are counting activities and are mandatory to hand in. Description of counting activities and requirements for completion are described in the lesson plan.
    - Interdiscplinary case:
      The students are to work in their study groups on an interdisciplinary project covering the learning objectives from all the subjects of the semester.

Examination (BM4):

Examination name:	Operation of Maritime Machinery
Examination type:	Portfolio (TMA, EEM or MAN/Method) Internal oral test Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery I (TMA I), • Electrical and electronic machinery I (EEM I) or • Management (MAN) includes "Human Ressource Management" and "Methodology" Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Thermal Machinery II — BM5

Content:

The overall scope of TMA II is to enable the student to operate different thermal systems such as environmental facilities, pumps, cooling and ventilation systems and pneumatic and hydraulics.

Learning objectives:

On completion of this subject, students must be able to :

Knowledge:

- Demonstrate proper terminology, define terms and describe function and properties of environmental facilities, components and systems.
- Present the causes and consequences of water and air pollution, and the consequences of the disposal of residues and contamination products in nature.
- Present the main principles, construction and methods of building climate and ventilation systems, taking indoor climate on human comfort and hygiene into consideration.
- Recall the principles of operation and adjustment of hydraulics and pneumatics systems.

Skills:

- Explain the methods for purification of water and air including organic water treatment plants and sludge treatment plant's construction.
- Describe the principles, construction and design of systems transporting liquids and air, and demonstrate application of documentation including relevant diagrams, monitoring equipment and instrumentation.
- Operate cooling and ventilation systems in accordance with laws, regulations and technical requirements.
- Demonstrate application of relevant documentation and diagrams, monitoring equipment and instrumentation in environmental facilities and systems.

Competencies:

- Communicate and present information effective in written and electronic formats in a collaborative environment
- Operate and observe combustion engine power plants, environmental systems and cooling and ventilation systems to optimize plant operation and remedy abnormal operation.
- Evaluate the condition of thermal machinery and system components
- Identify and use data to perform relevant calculations on thermal energy systems.

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials and student activity.
- Situation: Laboratory. The lab exercise is designed to supplement the learning objectives
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz qroups, learning cells, etc.. For student centered activities the instructor(s) are available for tutoring, professional guidance, and formative feedback.

- Workplace:
  Learning by utilizing engine room simulators.
- Portfolio:
  The portfolio is the student's reflection on how the learning objectives are reached and is a compilation of theory, workplace practice and context. Some core topics of the course are counting activities and are mandatory to hand in. Description of counting activities and requirements for completion are described in the lesson plan.
- Interdiscplinary case:
  The students are to work in their study groups on an interdisciplinary project covering the learning objectives from all the subjects of the semester.

Examination (BM5):

Examination name:	Environmental facilitites and power distribution
Examination type:	Portfolio (TMA or EEM/PAA) External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery II (TMA II), or • Electrical and electronic machinery II (EEM II) / Process Analysis Automation I (PAA I) Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Thermal Machinery III — BM6

Content:

The overall scope of BM6 is to prepare the student to be able to understand different processes in thermal systems, and the primary subject of this course is thermal powerplants.
Different types of powerplants and boilers will be included, and also combustion engines using different kinds of fuel will be part of this course.

Learning objectives:

On completion of this subject, students must be able to :

Knowledge:

- Demonstrate proper terminology, define terms and describe function, construction and properties of steam turbines, gas turbines, thermal power plants, facilities, components and systems.
- Explain The free market of electricity supply in Denmark.
- Present the main principles, construction and methods of thermal power plants, including modes of operation.
- Explain the principles of combustion engines, including safe operation, using various kind of fuel of fuel eg. ammonia, gas, diesel, hydrogen

Skills:

- Apply the laws, regulations and technical requirements for the steam plant.
- Demonstrate calculation of effects, consumption and efficiency in boilers and heat balance in combustion, heat transfer and steam generation.
- Apply relevant documentation and diagrams, monitoring equipment and instrumentation in thermal power plants and auxiliary systems

Competencies:

- Communicate and present information effective in written and electronic formats in a collaborative environment
- Operate the steam plant for heating purposes and supervise the operation mode to remedy abnormal operation.
- Evaluate the condition of thermal machinery and system components
- Identify and use data to perform relevant calculations on thermal energy systems.
- Optimize the operation of the plant so that it runs economically and in an environmentally friendly manner.

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials and student activity.
- Situation: Laboratory. The lab exercise is designed to supplement the learning objectives
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz qroups, learning cells, etc.. For student centered activities the instructor(s) are available for tutoring, professional guidance, and formative feedback.
    - Workplace learning by utilizing engine room simulators.
    - Portfolio. The portfolio is the student's reflection on how the learning objectives are reached and is a compilation of theory, workplace practice and context. Some core topics of the course are counting activities and are mandatory to hand in.

- Interdiscplinary case. The students are to work in their study groups on an interdisciplinary project covering the learning objectives from all the courses of the semester

Examination (BM6):

Examination name:	Energy Supply and Energy Production
Examination type:	Portfolio (TMA, EEM or (PAA & MAN) External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery III (TMA III), • Electrical and electronic machinery III (EEM III) or • Process Analysis Automation II (PAA II) & Management (MAN) includes "Environmental Management" Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Thermal Machinery IV — BM7

Content:

The overall scope of BM7 is to prepare the student to be able to optimize various thermal energy processes.

Learning objectives:

On completion of this subject, students must be able to :

Knowledge:

- Demonstrate the use of relevant theories and methods in connection to energyoptimization.

Skills:

Competencies:

- Identify and use data to perform relevant calculations in order to achieve environmental improvements to thermal energy systems
- Develop solutions for performance and energyoptimization on process plants.
- Achieve performance optimization in regards to reducing the impact on the environment.
- Communicate and present information effective in written and electronic formats in a collaborative environment

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz qroups, learning cells, etc.. For student centered activities the instructor(s) are available for tutoring, professional guidance, and formative feedback.
    - Workplace learning by utilizing engine room simulators.
    - Interdiscplinary case. The students are to work in their study groups on an interdisciplinary project covering the learning objectives from all the courses of the semester

Examination (BM7):

Examination Name:	Operational Optimization and Renewable Energy
Examination type:	Case (TMA & MAN) Internal oral test Group
Grade scale:	7-point scale
Preparation time:	None
Duration:	60 minutes for each group of 4 students
Aids allowed:	All
Important information:	Each student prepares 5 minutes pitch, and the students are then cross-examined in relevant topics of the case and the student's reflections based on the case. Each student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	The study group must hand in a case report in accordance with the lesson plan.

Thermal Machinery V — BM8

Content:

The overall scope of BM8 is to prepare the student to be able to develop and implement sustainable transition solutions.

Learning objectives:

On completion of this subject, students must be able to :

Knowledge:

Skills:

- Explain different types of sustainable energy plants, function and construction.

Competencies:

- Analyze thermal processes and apply relevant theory to implement solutions in regards to sustainable transistion.
- Communicate and present information effective in written and electronic formats in a collaborative e

Learning activities:

Examination:

Examination name:	Thermal Machinery - Sustainability Transitions
Examination type:	Project External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	The presentation of the project should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the project and the student's reflections based on the project. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	The project must be handed-in on time in accordance with the lesson plan.

BM – Subject Syllabus

Subject area:	**20400**	**Electrical and Electronic Machinery and Systems - BM**		
Subject(s):	20441	Electrical and electronic machinery I (**Part A**)	BM4	10 ECTS
	20451	Electrical and electronic machinery II (**Part A**)	BM5	5 ECTS
	20461	Electrical and electronic machinery III (**Part A**)	BM6	10 ECTS
	20471	Electrical and electronic machinery IV (**Part B**)	BM7	20 ECTS
Admission criteria:	Electrical and Electronic Machinery and Systems	BM4: None BM5: None BM6: None BM7: None		
Semester:	BM4 + BM5 + BM6 + BM7			
ECTS credits:	45 ECTS			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.			
STCW:	STCW Code, as amended: Part A, chapter III - Engine department: Section A-III/1 - Operational level Section A-III/2 – Management level. Section A-III/6 – Electro-technical officers			
Qualification prerequisites for professors/instructors etc.	Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.			
Core literature				
Certificate(s):	None			
Responsible:	Subject Manager			
Valid from:	2022-1	EIN		
Expired:				
Remarks:	None			

Purpose	BM

The main task in each semester is:

BM4	Operation of maritime machinery
BM5	Environmental facilitites and power distribution
BM6	Energy supply and energy production
BM7	Electrician's Authorization

Electrical and Electronic Machinery and Systems BM4, BM5, BM6 and BM7:
The purpose of Electrical and Electronic Machinery, Systems and Equipment is for the student to acquire qualifications within the electro-technical area to such an extent that the student is able to take care of the operation and maintenance of electrical systems on board ships and in industrial installations. The student shall be able to operate the electrical equipment under both normal and abnormal conditions and be able to carry out simple fault finding tasks.

El-Authorization - The General Part - BM7:
The student should be able to taking into account security, user requirements, environmental requirements, operational excellence wishes and regulatory requirements to perform commissioning and maintenance of electrical supply systems, electrical installations and consumption systems, performed for both high and low voltage, in accordance with relevant regulations, regulations, and directives.

El-Authorization - The Electrician Part - BM7:

The student must obtain the theoretical basis required in order to acquire an electrician's authorization *, while the choice of solutions takes into account economic, environmental and operational excellence. * (After the apprenticeship under the law of Electrician (in danish "installatørloven") are met)

Electrical and Electronic Machinery I | BM4

Content:

Learning objectives:

EEM 1:

Knowledge:

- Explain the characteristic of electrical 1, 2 and 3 phase systems
- Preparation of electro technical documentation

Skills:

- Perform calculations relating to voltage, current and resistance
- Use of English electro-technical terminology and concepts for communication purpose

Competencies:

- Solve, measure, and analyze electro technical calculations in AC circuits
- Communicate and present information effective written in a collaborative environment

EEM 2:

Knowledge:

- Describe relation between electrical and magnetic theory
- Identify and describe construction and function of electrical motors, generators, and transformers (simple form) and evaluate general operation

Skills:

- Identify and interpret electrical component data and electrical documentation
- Use electrical documentation to construct relay control systems

Competencies:

- Practice general measurements in electrical systems
- Communicate and present information effective in written and electronic formats in a collaborative environment

Learning activities:

EEM 1 & 2:

- **Situation:** Large Class:
  Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
- **Student-centered activity (SCA)**
  SCA is a project that utilizes the subject material of the course to construct an electrical relay control system. Students are expected to work in teams to design a relay control system and construct a solution a solution of it.
- **Situation:** Laboratory and simulator
  The lab and simulation exercises are designed to supplement the taught materials such as evaluation operation and function of electrical motors, generators, and transformers with guidance from teacher/tutor.
- **Portfolio:** Documentation of achievement of learning objectives and students' reflection on own progress

- **Counting Activates:** Mandatory laboratory assignments

Examination:

Examination name:	Operation of Maritime Machinery
Examination type:	Portfolio (TMA, EEM or MAN) Internal oral test Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the ▪ Thermal Machinery I (TMA I), ▪ Electrical and electronic machinery I (EEM I) or ▪ Management (MAN) includes “Human Ressource Management” and “Methodology” Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student’s reflections based on the portfolio. The student will receive one grade based upon the student’s presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Electrical and Electronic Machinery II — BM5

Content:

Learning objectives:

Knowledge:

- Explain construction and function of transformers
- Explain relevant electrical installation technical topics

Skills:

- Perform calculations related to the use of transformers where voltage drop, phase compensation and network stability are taken into account

Competencies:

- Solve and analyze electro technical calculations in relation to transformers, power factor controlling systems and voltage drops in the installation

Learning activities:

TLA1: Situation: Large Class
Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
TLA2: Situation: Laboratory and student-centred activity (SCA)
The lab exercises and SCA is designed to supplement the taught materials, including assessment of performance of transformers and power factor controlling systems, aswell as investigation of voltage drops in electrical installations.

Examination:

Examination name:	Environmental facilitites and power distribution
Examination type:	Portfolio (TMA or EEM/PAA) External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the ▪ Thermal Machinery II (TMA II) or ▪ Electrical and electronic machinery II (EEM II) / Process Analysis Automation II (PAA I) Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes.

	The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Electrical and Electronic Machinery III — BM6

Content:

Learning objectives:

EEM 1:

Knowledge:

- Explain short circuit currents in electrical installations
- Identify electronic circuits and components

Skills:

- perform calculations in circuits where short-circuit currents occur
- perform simple calculations in electronic circuits

Competencies:

- Analyze relevant data that occurs in circuits where short-circuit currents occur
- Apply, analyze and relate measurements in electrical installations
- Exemplify and employ use of electronic components which are the background in ISC(integrated ship control systems)-, battery-, and drives systems technology

EEM 2:

Knowledge:

- Explain and exemplify construction and function of marine electrical power systems

Skills:

- Use, examine and investigate operation of marine electrical power systems

Competencies:

- Communicate and present information about marine electrical systems in written and electronic formats in a collaborative environment

Learning activities:

EEM 1 & 2:

TLA1: Situation: Large Class
Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
TLA2: Situation: Laboratory and simulator
The lab and simulation exercises is designed to supplement the taught materials
TLA3: Student-centred activity (SCA)
SCA is primarily theoretical problem solving in study groups

Examination:

Examination name:	Energy Supply and Energy Production
Examination type:	Portfolio (TMA, EEM or (PAA & MAN) External oral exam Individual

Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the ▪ Thermal Machinery III (TMA III), ▪ Electrical and electronic machinery III (EEM III) or ▪ Process Analysis Automation II (PAA II) & Management (MAN) includes "Environmental Management" Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Electrical and Electronic Machinery IV | BM7

Content:

Learning objectives:

El-Authorization (Electrician license) - The General Part

Knowledge:

- Explain construction and operation method of electrical installation material for building low-voltage distribution networks and power stations (generation, transmission and main transformer

Skills:

- assessment of electrical installation material, to be able to make the correct selection and sizing of equipment

Competencies:

- Appointing electrical installation material, participate in the operation of power facilities and participate in the planning and execution of work on or near the high- and low-voltage systems
- do the assessment of the safety culture concerning the construction and operation of electrical installations and facilities
- use of English electro-technical terminology and concepts

El-Authorization (Electrician license) - The Electrician Part

Knowledge:

- Necessary additions to the "general part" so that sizing and material selection can be performed according to applicable rules (dansk standard ect.) for all existing electrical house and shore based industrial installations.

Skills:

- Necessary additions to the "general part" so that sizing and material selection can be performed according to applicable rules (dansk standard ect.) for all existing electrical house and shore based industrial installations.

Competencies:

- Necessary additions to the "general part" so that sizing and material selection can be performed according to applicable rules (dansk standard ect.) for all existing electrical house and shore based industrial installations.

Learning activities:

El-Authorization (Electrician license) - The General Part

TLA1: Situation: Large Class
Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
TLA2: Situation: Laboratory and simulator
The lab and simulation exercises is designed to supplement the taught materials
TLA3: Student-centred activity (SCA)
SCA is primarily theoretical problem solving in study groups

El-Authorization (Electrician license) - The Electrician Part

TLA1: Situation: Large Class
Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between
TLA2: Student-centred activity (SCA)
SCA is primarily theoretical problem solving in study groups

Examination:

Examination name:	Electrical and Electronic Machinery, Systems and Equipment
Examination type:	External oral exam
Grade scale:	7-point scale
Preparation time:	None
Duration:	20 minutes
Aids allowed:	All
Important information:	An appropriate number of representative exam questions will be prepared. The students are given opportunity to familiarize themselves with the exam questions in advance. Each student draws a random exam question on the exam day. The exam starts immediately afterwards, as the student demonstrates his/her knowledge in relation to the actual subject without aids and preparation.
Prerequisites for examination:	None

Examination:

Examination name:	El - authorization written
Examination type:	External written exam
Grade scale:	7-point scale
Preparation time:	None
Duration:	6 hours
Aids allowed:	All
Important information:	None
Prerequisites for examination:	None

BM – Subject Syllabus

Subject area:	**20500**	**Process Analysis and Automation (BM)**		
Subject(s):	20551	Process Analysis and Automation I	BM5	5 ECTS
	20561	Process Analysis and Automation II	BM6	5 ECTS
	20571	Process Analysis and Automation III	BM8	5 ECTS
Admission criteria:				
Semester:	BM5 + BM6 + BM8			
ECTS credits:	15 ECTS			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.			
STCW:	*STCW Code, as amended: Part A, chapter III - Engine department:* Section A-III/1 Section A-III/2.			
Qualification prerequisites for professors/instructors etc.	Associate professors or assistant professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.			
Responsible:				
Certificate(s):	None			
Responsible:	Subject Manager			
Valid from:	2022-1	EIN		
Expired:				
Remarks:				

Purpose — BM

The student should acquire the necessary professional skills and knowledge so that he can perform tasks in the areas of process analysis, optimization of operations , equipment selection , troubleshooting, and maintenance requirements for automation of technological processes within transport, power plants, production and environmental technology.
The student must also obtain the necessary professional skills in data acquisition, data logging, control and management techniques to act rationally and correctly by monitoring and operating of ship control systems

Key subjects:

A. Monitoring of process plants
B. Control and control loops of plant
C. Process analysis and optimization
D. Integrated Control Systems

Procesanalysis and Automation I — BM5

Content:

The purpose of this course is for students to develop basic skills in optimization of automation processes, equipment selection and troubleshooting and maintenance requirements for automation of technological processes within transport, power plants, production and environmental technology.

Learning objectives:

On completion of this course, students will be able to:

- (LO 1.1) ***Present*** proper terminology, ***define*** terms and ***recall*** function and properties of automation components
- (LO 1.2) ***Demonstrate*** application of documentation, sensors, transmitters, controllers and actuators in automation systems and ***apply*** principles of single-loop control of an automation process.
- (LO 1.3) ***Chose*** and ***apply*** instrumentation and control of an automation process
- (LO1.4) ***Operate*** and ***interpret*** readouts from integrated control systems and ***identify*** common components and structure of integrated control systems
- (LO 1.5) ***Communicate*** and ***present*** information related to an automation process effective orally in a collaborative environment

Learning activities:

Situation: Large Class
Large class activities take place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
Major Focus: LO 1.1, LO 1.2 and LO 1.3

Situation: Group work/Laboratory work
The group work exercises are designed to supplement the taught materials, such as principles of instrumentation and control as well as operation of integrated control systems. The learning activities are based on practical work with guidance from instructor/teacher
Major focus: LO 1.1, LO 1.2, LO 1.3 and LO 1.4

Student-centered activity (SCA)
SCA is a project where the student, as part of a team, develops a solution for practical regulation and instrumentation of a process
Major focus: LO 1.1, LO 1.2, LO 1.3 and LO 1.5

Examination:

Examination name:	Environmental facilitites and power distribution
Examination type:	Portfolio (TMA or EEM/PAA) External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery II (TMA II) or • Electrical and electronic machinery II (EEM II) / Process Analysis Automation I (PAA I) Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Procesanalysis and Automation II | BM6

Content:

This course provides students with knowledge of instrumentation and control systems and helps students develop practical skills in operation, modelling, design, simulation and analysis of control systems and their components commonly used in maritime industries, including functional safety and optimization of processes.

Learning objectives:

On completion of this course, students will be able to:

- (LO 2.1) ***Demonstrate*** proper terminology, ***define*** terms and ***describe*** function and properties of automation components
- (LO 2.2) ***Manage*** methodologies of functional safety principles and **exemplify** use of safety evaluation tools
- (LO 2.3) Demonstrate ***use*** of enhanced single-loop regulatory control principles and discrete control principles of an automation process
- (LO 2.4) ***Apply*** principles of PLC programming, including HMI and alarm management
- (LO 2.5) ***Select*** and a***pply*** automation-engineering principles to the ***design*** and i***mplementation*** of the automation of a simple process plant system including operational, functional and safety considerations
- (LO 2.6) ***Communicate*** and ***present*** information effective in written and electronic formats in a collaborative environment

Learning activities:

Situation: Large Class
Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
Major Focus: LO 2.1, LO 2.2, LO 2.3 and LO 2.4

Situation: Group work
The group work exercises are designed to supplement the taught materials, such as principles of process control, including enhanced single-loop regulatory control and discrete control as well as functional safety.
Major focus: LO 2.1, LO 2.2, LO 2.3 and LO 2.4

Student-centred activity (SCA)
SCA er et projekt hvor den studerende som en del af et team skal designe en automationsløsning inkluderende både sammensatte reguleringer, HMI og sekventielle styringer. Projektet er en del af et tværfagligt samarbejde med TMA, MAN, og EL.
Major focus: LO 2.1, LO 2.2, LO 2.3, LO 2.4, LO 2.5 and LO 2.6

Examination:

Examination name:	Energy Supply and Energy Production
Examination type:	Portfolio (TMA, EEM or (PAA & MAN) External oral exam

	Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery III (TMA III), • Electrical and electronic machinery III (EEM III), or • Process Analysis Automation II (PAA II) & Management (MAN) includes "Environmental Management" Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Procesanalysis and Automation III | BM7

Content:

The purpose of this course is to give students the necessary qualifications to assess process measurements, data collection and data logging so the person reacts rationally and corrects when monitoring and operating ships control systems.

Learning objectives:

On completion of this course, students will be able to:

- (LO3.1) ***Use*** proper terminology, ***define*** terms and ***evaluate*** function and properties of automation components
- (LO3.2) ***Identify*** and ***explain*** commonly used control system architecture and automation data networks
- (LO3.3) ***Apply*** knowledge and methodologies of calibration and documentation of instrumentation and measurements in process plant systems
- (LO3.4) ***Analyze*** a complex automation data network related issue, ***propose*** a solution and ***communicate*** and ***present*** information effective in written and electronic formats in a collaborative environment
- (LO3.5) ***Work*** effective as a ***team*** member in a small-scale engineering project. It is expected that the student after completion of teaching can engage constructively in professional collaboration by setting and meeting deadlines, give and receive feedback on peers and own professional performance, project management and organizing long-term work processes, including assignment of roles and tasks

Learning activities:

Situation: Large Class
Large class activities takes place in classroom setting or online in TEAMS and consist of lecturing and student activities in between.
Major Focus: LO 3.1, LO 3.2 and LO 3.3

Situation: Laboratory
The lab exercises are designed to supplement the taught materials such as control system structure, automation data networks and calibration and documentation of measurements in process plants systems
Major focus: LO 3.1, LO 3.2, LO 3.3 and LO 3.4

Student-centred activity (SCA)
SCA is a project that utilizes the subject material of the course to analyze a complex automation-related issue. Students are expected to work in teams to analyze an integrated control system and data network and design/develop a solution of it. The students are also expected to investigate cyber security aspects of the issue and make appropriate design decisions.
Major focus: LO 3.1, LO 3.4 and LO 3.5

Examination:

Examination name:	Process Analysis and Automation
Examination type:	Project or case report

	External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	The presentation of the project or case report should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the project or case report and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	The student must hand in a project or case report in accordance with the lesson plan

BM – Subject Syllabus

Subject area:	**20600**	**Management (BM)**		
Subject(s):	20641	Human Resource Management	BM4	5 ECTS
	20661	Environmental Management	BM6	5 ECTS
	20671	Operation & Maintenance Management	BM7	5 ECTS
	20681	Sustainable Business Development	BM8	5 ECTS
Admission - criteria:				
Semester:	BM4 + BM6 + BM7 + BM8			
ECTS credits:	20			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.			
STCW:	*STCW Code, as amended: Part A, chapter III - Engine department:* Section A-III/1 Section A-III/2.			
Certificate(s):	None			
Qualification prerequisites for professors/instructors etc.	Associate professors or assistant professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.			
Core literature				
Responsible:	Subject Manager			
Valid from:	2022-1	EIN		
Expired:				
Remarks:	None			

Purpose — BM4

Students are qualified as a leader of personnel and operations with due diligence to human, safety, quality and environment factors. The marine engineer can undertake the position as a leader in professional organizations in either the public or private sector. The purpose of this focus is to stimulate innovation from other industries into the maritime industry.

Human Resource Management — BM4

Content:

Learning objectives:

- **Describe** how organizational structure helps shape behavior in organizations
- **Define** basic organizing concepts such as division of labor, chain of command, and span of control
- **Apply** administrative maintenance tools
- **Describe** the basic characteristics of organizational culture
- **Assess** how leadership styles can affect the performance of the employee and teams within the organization
- **Evaluate** principles of human resource management and **distinguish** between different techniques, activities and approaches and their relevance to a multicultural environment

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting or on TEAMs, and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz groups, learning cells, etc.. For student centered activities the assistant or associate professor(s) are available for tutoring, professional guidance, and formative feedback.
    - Individual reading and answering of study questions
    - Course documentation. The course documentation is the student's reflection on how the learning objectives are reached and is a compliation of theory, workplace practice and context. Some core topics of the course documentation are counting activities and are mandatory to hand in.
    - Student presentations with peer-on-peer feedback.

Examination:

Examination name:	Operation of Maritime Machinery
Examination type:	Portfolio (TMA, EEM or MAN) Internal oral test Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes

Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery I (TMA I), • Electrical and electronic machinery I (EEM I) or • Management (MAN) includes “Human Ressource Management” and “Methodology Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student’s reflections based on the portfolio. The student will receive one grade based upon the student’s presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Environmental Management | BM6

Content:

Learning objectives:

- **Demonstrate** basic principles and methods, and regulation within the field of occupational Health, Safety and Environment
- **Define** the company's environmental policy and objectives
- **Manage** the company's obligations to comply with applicable legal requirements, obligations to other stakeholders and to regularly check its status
- **Assess** how safety and environmental issues can be handled within an organization, implement the necessary controls and set clear goals for improving safety and environmental efforts
- **Integrate** occupational Health, Safety and Environmental systems into the strategies of an organization
- **Describe** how to implement the changes needed to improve HSE management (change management)

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting or on TEAMs, and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz groups, learning cells, etc.. For student centered activities the assistant or associate professor(s) are available for tutoring, professional guidance, and formative feedback.
    - Individual reading and answering of study questions
    - Course documentation. The course documentation is the student's reflection on how the learning objectives are reached and is a compliation of theory, workplace practice and context. Some core topics of the course documentation are counting activities and are mandatory to hand in.
    - Student presentations with peer-on-peer feedback.

Examination:

Examination name:	Energy Supply and Energy Production
Examination type:	Portfolio (TMA, EEM or (PAA & MAN)) External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery III (TMA III), • Electrical and electronic machinery III (EEM III) or

	• Process Analysis Automation II (PAA II) & Management (MAN) includes "Environmental Management" Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Operation and Maintenance Management | BM7

Content:

Learning objectives:

- **Demonstrate** principles and methods, and concepts of maintenance and operation management
- **Identify** areas to minimize waste of resources
- **Assess** the importance of stakeholders, and their possible impact on operations
- **Apply** administrative maintenance tools
- **Evaluate** maintenance systems, and identify areas for improvement
- **Plan** projects using common methods and assessing the risks

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting or on TEAMs, and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz groups, learning cells, etc.. For student centered activities the assistant or associate professor(s) are available for tutoring, professional guidance, and formative feedback.
    - Individual reading and answering of study questions
    - Course documentation. The course documentation is the student's reflection on how the learning objectives are reached and is a compliation of theory, workplace practice and context. Some core topics of the course documentation are counting activities and are mandatory to hand in.
    - Student presentations with peer-on-peer feedback.

Examination:

Examination name:	Operational Optimization and Renewable Energy
Examination type:	Case (TMA & MAN) Internal oral test Group
Grade scale:	7-point scale
Preparation time:	None
Duration:	60 minutes for each group of 4 students
Aids allowed:	All
Important information:	Each student prepares 5 minutes pitch, and the students are then cross-examined in relevant topics of the case and the student's reflections based on the case. Each student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	The study group must hand in a case report in accordance with the lesson plan

Sustainable Business Development | BM8

Content:

Learning objectives:

- **Demonstrate** basic principles and methods, and regulation within the field of business economics and entrepreneurship
- **Analyze** and **assess** practical and theoretical issues within business economics, focusing on sustainable business development
- **Analyze** and **assess** practical and theoretical issues within organization, focusing on organizational design, strategies and business models
- **Assess** how to implement changes in the organisation
- **Distinguish** among the various types of innovation in organizations
- **Communicate** and **plan** how to implement possible solutions to sustainable business operation

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting or on TEAMs, and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz groups, learning cells, etc.. For student centered activities the assistant or associate professor(s) are available for tutoring, professional guidance, and formative feedback.
    - Individual reading and answering of study questions.
    - Course documentation. The course documentation is the student's reflection on how the learning objectives are reached and is a compliation of theory, workplace practice and context. Some core topics of the course documentation are counting activities and are mandatory to hand in.
    - Student presentations with peer-on-peer feedback.
    - Management project. The students are to work in their study groups on a management project covering relevant learning objectives from all the courses of the semesters'.

Examination:

Examination name:	Management – Sustainability Transitions
Examination type:	Project External oral exam Group
Grade scale:	7-point scale
Preparation time:	None
Duration:	60 minutes for each group of 4 students
Aids allowed:	All

Important information:	Each student prepares 5 minutes pitch, and the students are then cross-examined in relevant topics of the project and the student's reflections based on the project. Each student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	The study group must hand in a case report in accordance with the lesson plan

BM - Subject Syllabus

Subject area:	**20700**	**Interdisciplinary Elements and Methodology (BM)**		
Subject (s):	20741	Interdisciplinary Elements and Methodology I	BM4	5 ECTS
	20781	Interdisciplinary Elements and Methodology II	BM8	5 ECTS
	20791	Bachelor Project	BM9	15 ECTS
Admission criteria:	The final Bachelor Project period in BM9	All subjects of the BM education programme must be passed with accordance to the course regulations for Marine Engineer, except Professional Work Experience		
Semester:	BM4 + BM8 + BM9			
ECTS credits:	15 (Bachelor Project)			
Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.			
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.			
STCW:	None			
Certificate(s):	None			
Qualification prerequisites for professors/instructors etc.	***Bachelor Project:*** Associate professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted. Assistant professors can act as bachelor supervisors when they are on the final part of their master's degree.			
Core literature				
Responsible:	Subject Manager			
Valid from:	2022-1	EIN		
Expired:				
Remarks:	None			

Purpose

The purpose of this subject is to train the ability of the student to gather and process information and to find and utilise relevant theories in order to work with scientific projects based on a self defined problem within the area of the profession. The subject also trains the ability to combine knowledge from various fields within the profession as well as the ability to evaluate their own process of work and the results.

Interdisciplinary elements and Methodology I — BM4

Content:

Learning objectives:

On completion of this subject, students must be able to :

Knowledge:

- present proper terminology within the field of scientific methods
- recall various theories af scientific approaches

Skills:

- gather quantitative and qualitative data
- design quantitative and qualitative research, analyse the result, and assess the reliability and validity of the results.
- choose relevant and reliable information, including primary and secondary litterature and data
- produce a well structured paper in accordance with academic standards

Competencies:

- define a relevant research problem within the field of the profession
- evaluate and discuss the results and conclusions
- Reflect upon own learning needs, study group efficiency, group roles and collaboration with professors
- Apply different methods of managing projects

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz qroups, learning cells, etc.. For student centered activities the assistant or associate professor(s) are available for tutoring, professional guidance, and formative feedback.

Examination:

Examination name:	Operation of Maritime Machinery
Examination type:	Portfolio (TMA, EEM or MAN) Internal oral test Individual
Grade scale:	7-point scale

Preparation time:	None
Duration:	30 minutes
Aids allowed:	All
Important information:	At the examination, the student presents his/her portfolio with focus on either the • Thermal Machinery I (TMA I), • Electrical and electronic machinery I (EEM I) or • Management (MAN) includes "Human Ressource Management" and "Methodology" Each student is randomly assigned their focus by the Student Services, and the student is informed of focus at the start of examination. The presentation of the portfolio should have a duration of about 5 minutes. The remainder of the time is for cross-examination of the relevant part of the portfolio and the student's reflections based on the portfolio. The student will receive one grade based upon the student's presentation and performance at the exam.
Prerequisites for examination:	Counting activities are completed. Description of counting activities and requirements for completion are described in the lesson plan.

Interdisciplinary elements and Methodology II — BM8

Content:

Learning objectives:

On completion of this subject, students must be able to :

Knowledge:

•

Skills:

- apply theories of scientific approaches
- write a scientific paper in accordance with academic standards
- demonstrate data analysis

Competencies:

- evaluate and discuss the chosen research designs, -methods and the process.
- produce a structured and well argumented professional paper in accordance with academic standards on complex and relevant professional issues.
- To critical reflect and evaluate different types of research designs

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz qroups, learning cells, etc.. For

student centered activities the assistant or associate professor(s) are available for tutoring, professional guidance, and formative feedback.	
Examination:	
Examination name:	
Examination type:	
Grade scale:	
Preparation time:	
Duration:	
Aids allowed:	
Important information:	
Prerequisites for examination:	

Bachelor project — BM9

Content:

Learning objectives:

On completion of this subject, students must be able to :

Competencies:

- define a relevant research problem within the field of the profession
- apply relevant scientific research designs and methods to the problem
- evaluate and discuss the chosen research designs, -methods and the process. Evaluate, discuss and disseminate the results and conclusions with professionals in the maritime industry

Learning activities:

- Situation: Large class. The large class activity takes place in the classroom setting and consists of an introduction to the bachelor project.
- Student centered activities. The student centered activities can be performed on an individual or group basis. Each student or group of students can choose between available assistant and associate professors for tutoring and guidance on the project.
- Bachelor project. The research, analysis work and production of the project is the sole student centred activity of the semester.

Examination:

Examination name:	Bachelor thesis
Examination type:	External oral exam Individual
Grade scale:	7-point scale
Preparation time:	None
Duration:	1 hour
Aids allowed:	All
Important information:	**Exam Language:** • The project can be written in either English or Danish, and evaluated in the language of the student's choice. • The examination will be carried out in either English or Danish. The student must notify the student administration if the project and the examination will be held in English. Notice is given when handing in the preliminary problem statement. • The ability to formulate and spell is an integral part of the assessment of the academic content. **Examination:** • The student starts the examination with a 15 minutes' presentation.

	Before examination: • The BA methodology course must be passed before handing in the preliminary problem statement. • The preliminary problem statement must be handed in no later than 2 weeks after commencing the project period in accordance with the lesson plan • The final problem statement must be approved by the supervisor and handed in/uploaded as described in the lesson plan no later than 3 weeks before the deadline set for the final hand-in of actual project. **After examination:** Students resitting the exam do not need to hand in a preliminary problem statement or a final problem statement, provided it has been approved by the supervisor for re-examination.
Prerequisites for examination:	All other subjects and Professional Work Experience of the BM education programme must be passed in accordance with the course regulations for Master Engineer. The bachelor project must be handed-in on time in accordance with the lesson plan.

BM – Subject Syllabus

Subject area:	**20800**	**Elective Subjects (BM)**	
Subject(s):	88100	Elective Subject (BS, **BM**, BJ & SE)	
	88109	Negotiating Skills	3 ECTS
	88110	Communication Skills	2 ECTS
	88115	Maritime Automation and IT	3 ECTS
	88147	Data Network for Automation Purpose	3 ECTS
	88119	PLC, Fieldbus and SCADA	2 ECTS
	88123	Robot I - Basic	2 ECTS
	88129	Advanced English	2 ECTS
	88148	Innovation and Entrepreneurship I+II	5 ECTS
	88140	Electrical Maritime Practice	2 ECTS
	88149	How to Start a Business and Private Legislation	5 ECTS
	88143	Globalization	2 ECTS
	88145	Advanced Training for Oil & Chemical Tanker Cargo Operations	3 ECTS
	88146	Human Factors in Safety	5 ECTS
	88150	Cross-Cultural Leadership	3 ECTS

		Automation Elective Subjects (BM5)	
	88150	Cross-Cultural Leadership	3 ECTS
	88123	Robot I - Basic	2 ECTS
	88148	Innovation and Entrepreneurship I+II	5 ECTS
		Automation Elective Subjects (BM8)	
	88115	Maritime Automation and IT	3 ECTS
	88147	Data Network for Automation Purpose	3 ECTS
	88119	PLC, Fieldbus and SCADA	2 ECTS
	88140	Electrical Maritime Practice	2 ECTS

		Management Elective Subjects (BM5)	
	88150	Cross-Cultural Leadership	3 ECTS
	88110	Communication Skills	2 ECTS
	88148	Innovation and Entrepreneurship I+II	5 ECTS

	Management Elective Subjects (BM8)	
88109	Negotiating Skills	3 ECTS
88149	How to Start a Business and Private Legislation	5 ECTS
88143	Globalization	2 ECTS
20850	**Maritime Elective Subjects - BM5(SØ)**	
28253	Safety at Work (II) including §16	2 ECTS
28213	Elementary First Aid	1 ECTS
28219	Medical First Aid	
28217	Basic Training for Oil, Chemical and Gas Tanker Operations	1 ECTS
28240	Maritime Technology including Maritime English	
28241	Ship Propulsion	2 ECTS
28242	Ship Auxiliary and Service Systems	2 ECTS
28243	Maritime English	2 ECTS
20880	**Maritime Elective Subjects - BM8(SØ)**	
28211	Safety at Sea	1 ECTS
28505	Basic Fire Fighting Theory	1 ECTS
28506	Basic Fire Fighting Course	
28507	Advanced Fire Fighting Theory	1 ECTS
28508	Advanced Fire Fighting Course	
28261	Maritime law and Ship's Management including SSO	3 ECTS
28231	Ship Technology and Docking	4 ECTS
28220	Watchkeeping Duty in Engine Room (FMM Simulator Assessment)	

Syllabus

Subject area:	**88000**	**Elective Subject (BS+BM+BJ+SE)**	
Subject(s):	88100	Elective Subject	
	88109	Negotiating Skills	3 ECTS
Admission criteria:	None		
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BS5 + BS7 + BM8 + BJ5/BJ6 + SE(SKF) + SE(MCH) + SE(SCH) BM8 (Specialization: Management)		
ECTS credits:	3		
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:	None	
Certificate(s):	None	
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	None	

Purpose

This negotiating skills course will enable students to understand how they can negotiate constructively with principals, colleagues, suppliers and contact negotiations and be able to carry out a negotiation, which creates a win-win outcome for all parties. This course covers all the basics of negotiating in a practical and interactive way.

Learning objectives

Negotiating Skills (88109):

Knowledge:

- Your values and how they impact on your negotiations.
- Understanding the nature of the gap between you and the other party.
- Styles and negotiators.
- Understand the structure underlying all negotiations.
- Identify the appropriate skills used in negotiations.
- Creating win-win negotiations.
- Preparing for a negotiation and setting objectives.
- Finding out as much as you can about the other party's needs and aspirations.
- Developing a strategy for success.
- Framing.
- Recognizing and dealing with 'underhand' tactics and manipulation.
- The importance of establishing a productive environment.
- Cross-cultural negotiations – understanding and dealing with different cultures.
- Understanding the meaning and importance of body language.
- Understanding the communication process.

Skills:

- Listening skills.
- Assertiveness - how to be assertive, but not aggressive, in negotiations.
- Questioning skills.
- Finding innovative solutions to objections.
- Summarizing and synthesizing skills.

Competencies:

- Open a negotiation.
- Conduct a negotiation both in English and in Danish.
- Handle objections.
- Question his or her negotiating partner.

Core literature

Forhandlingsteknik i teori og praksis af Anne Bay Nordtorp.

Examination

Negotiating Skills (88109):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

Associate professors or assistant professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is the same or higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88000**	**Elective Subject (BS+BM+BJ+SE+Tutor)**	
Subject(s):	88100	Elective Subject	
	88110	Communication Skills	2 ECTS
Admission criteria:	None		
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BS5 + BS7 + BM8 + BJ5/BJ6 + SE(SKF) +SE(MCH) +SE(SCH) + Tutor BM8 (Specialization: Management)		
ECTS credits:	2		
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. • Order on the professional bachelor training programme for Marine Engineer – Danish order no1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE! eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:	None	
Certificate(s):	None	
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	None	

Purpose

The student will obtain knowledge, skills, and competences for planning, carrying out, and reflecting on the communication of a message by various means.

Learning objectives

Communication Skills (88110):

<u>Knowledge</u>:

- The basic terms of communication.
- The background of the participants/receivers.
- The effects of various means of communicating a message and the interaction between the sender and receiver of a message.

<u>Skills</u>:

- Plan and carry out the communication of a message by various means and to various target audiences.
- Choose the method to communicate a message.
- Use common technical means to communicate or present a message (e.g. presentation software, A/V equipment).

<u>Competencies</u>:

- Reflect on a communication course carried out.
- Estimate which means of communication would be appropriate in a given situation.
- Suggest adjustments based on the evaluation of a communication course.

Core literature

None

Examination

Communication Skills (88110):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

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  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88000**	**Elective Subject (BM+SE)**	
Subject(s):	88100	Elective Subject	
	88115	Maritime Automation and IT	3 ECTS
Admission criteria:	BM: SE:	None None	
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BM8 + SE(MCH) + SE(SCH) BM8 (Specialization): Automation)		
ECTS credits:	3		
Course Regulations:	• Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		
STCW:	None		
Certificate(s):	None		
Responsible:	Subject Manager		
Valid from:	2022-1	EIN	
Expired:			

Syllabus

Remarks:	None

Purpose

The student shall acquire a basic knowledge about TCP/IP automation network solutions in ships, so he/she can contribute and participate in making decision according to operation, purchasing and maintains of Bridge- and Cargo control systems.

Learning objectives

Maritime Automation and IT (88115)

Knowledge:

- Physical data-network components.
- Network protocols in maritime automation networks.
- TCP/IP diagnose software.
- Description and analysis of the need's for maritime automation solutions.
- Solving a practical task with consideration to safety, options, operation and maintenance so he/she are challenged to pursue problem solving that demonstrates independently innovative thinking and behavior.

Skills:

- Study technical literature and manuals in English.
- Use practical automation and network equipment components in the laboratory.

Competencies:

- Use of automation components communicating by TCP/IP network.
- Use of antivirus software.
- Preparation of specifications and evaluation of tender documents from suppliers.

Core literature

- Praktisk regulering og automation af Thomas Heilmann.
- TCP/IP- Bogen af Mose & Ferré.
- Literature on the internet and manuals for Software and technical information for the used equipment (share 75 %).

Examination

Maritime Automation and IT (88115):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

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Syllabus

Subject area:	**88000**	**Elective Subject (BM+SE)**	
Subject(s):	88100	Elective Subject	
	88147	Data Network for Automation Purpose	3 ECTS
Admission criteria:	BM student: SE student:	None None	
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BM8 + SE(MCH) + SE(SCH) BM8 (Specialization: Automation)		
ECTS credits:	3		
Course Regulations:	• Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		
STCW:	None		
Certificate(s):	None		
Responsible:	Subject Manager		
Valid from:	2022-1	EIN	
Expired:			
Remarks:	Replaces “88117 Data Network for Automation Purposes” (2 ECTS) from 2021-2.		

Purpose

The student shall archive basic knowledge about industrial IT solutions, so he can participate to make competent decisions within, purchasing, operating and maintenance.

Learning objectives

Data Network for Automation Purpose (88117):

Knowledge:

- Architecture of the internet.
- Network safety issue.
- Publishing of live data on the web.
- Demonstrate Innovative thinking in problem solving

Skills:

- Trouble shooting.
- Study manuals for equipment and technical literature in English language.
- Use of practical equipment components in laboratory to solve a problem, so he demonstrate independently thinking and behavior about solutions and options.

Competencies:

- After submission of this module it's the goal that the student are able to analyze and construct partially elements of an industrial data network system.
- Basic of TCP/IP Network

Core literature

- Articles and instructions manuals and technical literature according to the used equipment, (share: 85%).

Examination

Data Network for Automation Purpose (88117):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

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Syllabus

Subject area:	**88000**	**Elective Subject (BM+SE)**	
Subject(s):	88100	Elective Subject	
	88119	PLC, Fieldbus and SCADA	2 ECTS
Admission criteria:	BM : SE:	None None	
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BM8 + SE(MCH) + SE(SCH) BM8 (Specialization: Automation)		
ECTS credits:	2		
Course Regulations:	• Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		
STCW:	None		
Certificate(s):	None		
Responsible:	Subject Manager		
Valid from:	2022-1	EIN	
Expired:			

Syllabus

Remarks:	None

Purpose

After completion the independent student is able to analyze an automation task and configure set-up and program PLC equipment in a fieldbus network.

Learning objectives

PLC, Fieldbus and SCADA (88119):

Knowledge:

- Use of practical equipment components in laboratory to solve a problem, so he/she demonstrate independent innovative thinking and behavior in problem solving.
- Handling of safety and documentation according to European and International standards.
- Use of diagnostic tools and equipment for Profibus

Skills:

- **PLC:**
  - Select equipment on basis of information in datasheets, configure set-up in software and programming of PLC equipment.
  - Study manuals for equipment and other technical literature for used equipment in English language.
- **Fieldbus:**
  - Able to configure a PROFIBUS fieldbus system.
  - Able to trouble shooting in PROFIBUS fieldbus system networks.

Competencies:

- Working on Profibus fieldbus by; replacing, set-up new Profibus nodes and perform trouble shooting.

Core literature

- Manuals, technical literature for used equipment and software in English language.

Examination

PLC, Fieldbus and SCADA (88119):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

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Syllabus

Subject area:	**88000**	**Elective Subject (BM+BJ+SE)**	
Subject(s):	88100	Elective Subject	
	88123	Robot I - Basic	2 ECTS
Admission criteria:	None		
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BM5 + BJ5 + SE(MCH) + SE(SCH) BM5 (Specialization: Automation)		
ECTS credits:	2		
Course Regulations:	• Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Master - Danish order no. 1349 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		
STCW:	None		
Certificate(s):	None		
Responsible:	Subject Manager		
Valid from:	2022-1	EIN	
Expired:			

Syllabus

Remarks:	None

Purpose

The focus is to gain basic knowledge about robot technology with focus on autonomous robot.

Learning objectives

Robot I – Basic (88123):

Knowledge:

- To classify robots.

Skills:

- Qualified selection of sensors.
- Using practical equipment components in laboratory, so the student are challenged to problem solving and doing exercises that demonstrate independent thinking and behavior and dealing with options and solutions.
- Study literature and manuals for equipment's and software in English language.

Competencies:

- Design simple robot program for autonomous application.

Core literature

- International version of user manuals for equipment and other technical product information, in English
- Use of Help function in programming software, in English
- Agreement with the teacher

Examination

Robot I – Basic (88123):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

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  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88000**	**Elective Subject (BS+BM+BJ+SE)**	
Subject(s):	88100	Elective Subject	
	88129	Advanced English	2 ECTS
Admission criteria:	The student should have demonstrated in a previous exam or in spoken and written tests the ability to speak and write English at the level 10 on the trini-scale or a level C1 on the Common European Scale for Languages (CEFR)		
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BS5 + BS7 + BM5 + BM8 + BJ5/BJ6 + SE(SKF) + SE(MCH) +SE(SCH)		
ECTS credits:	2		
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:	None	
Certificate(s):	None	
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	None	

Purpose

To enable the student to work as a Ships Officer or Master Engineer with a competence and ability in English so he/she can compete for jobs on sea or on land, conduct business in an international working environment, and carry out research and other enquiries in the maritime merchant sector.

Learning objectives

Advanced English (88129):

Knowledge:

- The language and vocabulary of job applications and interviews, human resources, qualifications and relevant personal experience.
- The language of technical reports, ordering supplies, communications with ship owners and charterers, and maintaining efficiency onboard.
- The language of environmental protection, emissions and the latest developments in these fields.
- The language of negotiating, diplomacy, and managing cultural differences.
- The language of planning, meetings, decision making and teamwork.
- Appropriate English for projects, surveys and research into maritime topics.

Skills:

- Write job applications and Curriculum Vitae to international companies.
- Conduct him/herself well in job interviews.
- Write letters and reports in relation to his job of Master or Chief Engineer.
- Analyze, advise and report on ship efficiency and environmental protection matters in English.
- Negotiate and use diplomacy in English when dealing with people of all ranks.
- Organize his/her own work and those of others in English.
- Carry out maritime research and surveys, and be familiar with project methodology language, in English.

Competencies:

- Act and speak with confidence in the modern international merchant shipping world.

- Communicate in writing to all major stakeholders.
- Complete research or projects in English which should be of a sufficient level to be published.

Core literature

Science Research Writing for non-Native Speakers, H.G.Glasman-Deal, 2014, Imperial College Press, UK

Examination

Advanced English (88129):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

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  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88000**	**Elective Subject (BS+BM+BJ+SE)**	
Subject(s):	88100	Elective Subject	
	88148	Innovation and Entrepreneurship - Module I+II	5 ECTS
Admission criteria:	None		
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BS5 + BS7 + BM8 + BJ5 + SE(SKF) + SE(MCH) + SE(SCH) BM8 (Specialization: Management) + BM8 (Specialization: Automation)		
ECTS credits:	5		
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. This order is for students who were registered in BS1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:	None	
Certificate(s):	None	
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	Replaces “88130 Innovation and Entrepreneurship (I+II)” (6 ECTS) from 2021-2.	

Purpose

The student should obtain skills, knowledge and competences in order to understand and work with the fundamental focus areas of Innovation and Entrepreneurship.

Learning objectives

Innovation and Entrepreneurship – Module I & II (88130):

Both module I and module II are based on student ideas and projects – therefore the precise content and perspectives are variable.
Both in module I and module II, the students are encouraged to participate in “Start-Up-Programme” by “FFE-YE”

Module I:

Knowledge:

- Idea generating. Idea generating techniques and methods.
- The fundamental parts of an innovation process
- The principles of effectual entrepreneurship

Skills:

- Identify market needs and perspectives
- Idea screening and development
- Simple idea descriptions and prototyping
- Oral and written pitching

Competencies:

- None

Module II:

Knowledge:

- Basic elements of a business plan
- Content of “Business Model Canvas”

- Basic Business Models

Skills:

- Strategic business development
- Causation and effectuation principles
- Evaluation of business ideas and models.
- Oral presentation

Competencies:

- Written Business Plan and presentation

Core literature

"Entreprenørskab i teori og praksis" – IDEA 2009
"Innovation" – Systime
"Effectual Entrepreneurship" – S. Sarasvathy
www.iværk.dk
www.amino.dk
www.startvækst.dk

Examination

Module I & II:

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

Associate professors or assistant professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is the same or higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88000**	**Elective Subject (BM+BJ+SE)**	
Subject(s):	88100	Elective Subject	
	88140	Electrical Maritime Practice (Maritime Electrical Installations and Switchboards, Documentation and Troubleshooting)	2 ECTS
Admission criteria:	None		
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BM8 + BJ5 + SE(MCH) + SE(SCH) BM8 (Specialization: Automation)		
ECTS credits:	2		
Course Regulations:	• Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:	None	
Certificate(s):	None	
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:		

Purpose

Low voltage working at or near live electrical installations:
Competencies regarding work tasks and operation tasks at or near low voltage installations, with or without voltage in accordance with safety precautions regarding people, installations and operation.

Troubleshooting and circuit diagrams:
Competencies regarding troubleshooting in Maritime electrical equipment and systems based on circuit diagrams and function knowledge.

Construction and wiring of electrical switchboards:
Skills regarding construction, documentation and practical wiring of electrical switchboards

Electrical measurements:
Skills regarding measuring in electrical installations and safe handling of common instruments

Remarks:
The teaching methodology is mainly based on work shop principles regarding the troubleshooting tasks

Learning objectives

Electrical Maritime Practice (88140):

Knowledge:

- Security of necessary tools and equipment, measurement technique
- First Aid regarding electrical accidents
- Maritime Electro technical documentation

Skills:

- Safety management regarding electrical installations
- Preparation of documentation regarding risk assessment
- Operational skills regarding work at or near maritime low-voltage installations and systems, with or without live voltage

- Determination of functionality for electrical equipment, and documentation regarding main- and auxiliary circuit diagrams
- Operational skills regarding electrical measuring instruments
- Construction, documentation and wiring of electrical switchboards

Competencies:

- Operational competences within working at or near maritime low-voltage installations and systems, with or without live voltage in accordance with specified safety precautions for people, installations and operation
- Preparation of electrical documentation
- Troubleshooting in Maritime electrical installations

Core literature

- Power point
- Tasks and exercises (Moodle)
- Web -Automation: www.pcschematic.dk/skole

Examination

Electrical Maritime Practice (88140):

Examination type:	Ongoing assessment
Grading scale:	Passed/Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	Attendance is mandatory

Qualification prerequisites for professors/instructors etc.

Associate professors or assistant professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is the same or higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88100**	**Elective Subjects (BS+BM+SE)**	
Subject(s):	88100	Elective Subject	
	88 149	How to Start a Business and Private Legislation	5 ECTS
Admission criteria:			
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BS5 + BS7 + BM8 + SE(SKF) + SE(MCH) + SE(SCH) BM8 (Specialization: Management)		
ECTS credits:	5		
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:		
Certificate(s):		
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	Replaces "88142 How to start a busines and Private Legislation" (4 ECTS) from 2021-2.	

Purpose

The purpose of this subject is to give the students an understanding of how to start a company. This subject will present methods and concepts that will help the student to select relevant assets and competencies and to develop strategies in branding, advertising, distribution, manufacturing and finance.

Learning objectives

How to Start a Business and Private Legislation (88142):

Knowledge:

- The 4 P's
- Industry and competitor analysis
- Consumer analysis and behavior
- Consumer in the marketplace
- Market analysis
- Environmental analysis
- Cost analysis
- Basic principles of commercial law
- Contracts when buying or selling

Skills:

- Develop an outline of a business plan for a new concept or business idea and analyze the same
- Asses the profitability and risk of a business model, including legal issues
- Understand the Contracts Act
- Understand the principles behind the Sale of Goods and Supply of Services Act (the Danish Sale of Goods Act)
- Understand the principles of liability law
- Apply knowledge of the Construction Act and AB92
- Apply knowledge of national and international private law
- Understand the principles behind insurance

Competencies:

- Evaluate the business value and feasibility of a new business idea or concept
- Prepare an outline of an implementation plan on how to start a new business based on a given business model

Core literature

N/A

Examination

How to Start a Business and Private Law (88142)

Examination type:	Ongoing assessment
Grading scale:	Passed/Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

Associate professors or assistant professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is the same or higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88000**	**Elective subjects (BJ+BS+BM+SE)**	
Subject(s):	88100	Elective subject	
	88143	Globalization	2 ECTS
Admission criteria:			
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BS5 + BS7 + BM8 + BJ5 + BJ6 + SE(SKF) + SE(MCH) + SE(SCH) BM8 (Specialization Management)		
ECTS credits:	2		
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:		
Certificate(s):		
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:		

Purpose

The purpose of this subject is to give the students an understanding of the globalization process. This subject will equip the students with some knowledge of the happenings in the field of economy, finance, culture and politics – with an emphasis on market and consumer behavior.

Learning objectives

Globalization (88143):

Knowledge:

- Globalization and the new global economy
- Continuity and change in the world economy since the 1970s
- Regional and multilateral agreements
- The field of economy, finance, culture and politics
- The development of new markets
- Consumer behavior and how it affects international trade and shipping
- Techniques on how to spot market opportunities
- The consequences of outsourcing

Skills:

- Understand the globalization process
- Understand the mechanism of international economic connections through which it works and an idea of some of the debates it has evoked
- Analyze market opportunities
- Reflect on how the maritime industry can explore market opportunities
- Reflect on different scenarios raised

Competencies:

- Critically evaluate and assess a market
- Critically evaluate global transformation

Core literature

N/A

Examination

Globalization (88143):

Examination type:	Ongoing assessment
Grading scale:	Passed/Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

Associate professors or assistant professors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is the same or higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

Syllabus

Subject area:	**88000**	**Elective Subject (BS, BM & SE)**	
Subject(s):	88100	Elective Subject	
	88145	Advanced Training for Oil and Chemical Tanker Cargo Operations	3 ECTS
Admission criteria:	• Passed Basic Training for Oil, Chemical & Gas Tanker Cargo Operations • BM students must have passed all subjects in BM2(Maritime Operations) (Subject area Work Experience: 21110, 21150, 21160, 21180, 21190 & 25425)		
Criteria to pass subject	These assessments make up the subject: 1. **None** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **One** assessment graded Passed/Not Passed. • This assessment must be graded Passed.		
Semester:	BS5 + BS7 + BM8 (Maritime Operations), SE(SKF) + SE(MCH) + SE(SCH)		
ECTS credits:	3		
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022.		
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish Order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.		

Syllabus

STCW:	*STCW Code, as amended: Part A, chapter V - Special training requirements:* Section A-V/1-1, paragraph 2 • Paragraph 2 Advanced training for oil tanker cargo operations as set in tablet A-V/1-1-2 Section A-V/1-1, paragraph 3 • Advanced training for chemical tanker cargo operations as set in tablet A-V/1-1-3	
Certificate(s):	*Course Certificate of Advanced Training for Oil Tanker Cargo Operations* is issued upon completion of the training programme prescribed in Regulation V/1-1, paragraph 4.3 of the STCW Convention of 1978, as amended and the Danish order no 1165 3. November 2014, as amended. *Danish Maritime Authority can issue Certificate of Proficiency in Advanced Training for Oil Tanker Cargo Operations* when experience of at least 3 months relevant seagoing service on an Oil Tanker is proved and completed the specialized training programme prescribed in Regulation V/1-1 paragraph 4 of the STCW Convention of 1978, as amended. *Course Certificate of Advanced Training for Chemical Tanker Cargo Operations* is issued upon completion of the training programme prescribed in Regulation V/1-1, paragraph 6.3 of the STCW Convention of 1978, as amended and the Danish order on training programme for Tanker Operations and the Danish order no 1165 3. November 2014, as amended. *Danish Maritime Authority can issue Certificate of Proficiency in Advanced Training for Chemical Tanker Cargo Operations* when experience of at least 3 months relevant seagoing service on Chemical Tankers is proved and completed the specialized training programme prescribed in Regulation V/1-1, paragraph 6 of the STCW Convention of 1978, as amended.	
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	None	

Syllabus

Purpose

The overall purpose is to enhance safety of chemical and oil tanker cargo operations on board chemical and oil tankers and thereby reducing the risk of injuries or death to crewmembers and preventing damage to the ship, the cargo and the environment. The course will provide the student the knowledge, skills and competences to safely perform and monitor cargo operations taking cargo hazards into account in relation to occupational health and safety and the environment in compliance with legislative requirements.

Learning objectives

Advanced Training for Oil and Chemical Tanker Cargo Operations (88145):

Knowledge:

- Chemical and oil tanker design, cargo systems and equipment including:
  - Chemical and oil tanker
    - General arrangement and construction
    - Pumping arrangement and equipment
    - Slop management
    - Ballast systems
    - Fire-fighting systems
    - Cargo area venting and accommodation ventilation
    - Vapour recovery systems
  - Chemical tanker specifically
    - Tank construction and arrangement
    - Pipeline and drainage systems
    - Tank and cargo pipeline pressure and temperature control systems and alarms
    - Gas detection equipment
    - Cargo heating and cooling systems
    - Tank cleaning system
    - Cargo tank environment control
    - Tank, pipeline and fittings' material and coating
  - Oil tanker specifically
    - Tank arrangement, pipe system and tank venting arrangement
    - Gauging control systems and alarms
    - Cargo heating systems
    - Tank cleaning, gasfreeing and inerting systems
    - Electric and electronic cargo control systems
    - Environmental protection equipment incl. ODME
    - Cargo pressure and temperature control systems
  - Pump theory, different types of pumps and their operation
  - Tanker safety culture and SMS
  - Monitoring and safety systems including ESD
  - Monitoring procedures and safety systems initiating immediate action according to procedures for chemical tankers
- Loading, unloading, care and handling of cargo including:
  - The cargo's effect on trim, stability and structural integrity
  - Loading and unloading plans

  - Ballast and deballasting
  - Tank cleaning operations
  - Tank atmosphere control, inerting and gasfreeing
  - Specifically for oil tankers
    - COW
    - Load on Top
    - Ship to ship transfer
  - Specifically for chemical tankers
    - Inhibition and stabilization requirements
    - Heating and cooling requirements and consequences to adjacent cargo
    - Cargo compatibility and segregation
    - High-viscosity cargoes
    - Cargo residue operations
    - Operational tank entry
- Physical and chemical properties of noxious liquid and oil cargoes including the MSDS chemical cargo information and:
  - Chemical cargoes categories (corrosive, toxic, flammable and explosive)
  - Chemical groups and industrial usage
  - Reactivity of cargoes
- Hazards and the appropriate precautions to counter these during cargo operations including:
  - Flammability and explosion
  - Toxicity
  - Health hazards
  - Inert gas composition
  - Electrostatic hazards
  - Reactivity
  - Corrosively
  - Low boiling point cargoes
  - High density cargoes
  - Solidifying cargoes
  - Polymerizing cargoes
  - Dangers of non-compliance with relevant rules and regulations
- Occupational health and safety including:
  - Safe work practices
  - Precautions when entering enclosed spaces
  - Repair work precautions including cold and hot work
  - Electrostatic precautions
  - Use of PPE
- Emergency procedures on board chemical and oil tankers
- Precautions to prevent pollution of the environment
- Legislative requirements concerning chemical and oil tanker cargo operations
- Industry requirements concerning chemical and oil tanker cargo operations

Skills:

- Planning of cargo operations with regards to:
  - Ship arrangement, cargo systems and equipment
  - Ship stability, trim and stress
  - Cargo properties and hazards
  - Application of occupational health and safety and safe working practices including risk assessment and personal shipboard safety relevant for chemical and oil tankers

- Environmental and local legislative requirements
- Industry guidelines
- Perform and monitor cargo operations and react appropriately on failure of systems or services essential to cargo operations

- Cargo measurement and calculations
- Manage and supervise personnel with cargo-related responsibilities
- Calibrate and use gas monitoring and detection systems and equipment
- Responds to emergencies according to MFAG and the SOPEP/SMPEP including ESD, rescue from enclosed spaces and fire fighting
- Take precautions to avoid pollution of the atmosphere and the environment
- Monitor and control compliance with legislative requirements i.e. MARPOL convention, IBC code, other relevant IMO guidelines, industry guidelines and commonly applied port regulations

Competencies:

- Conduct safe chemical and oil tanker cargo operations

Core literature

- SOLAS Convention
- MARPOL Convention
- FSS Code
- IBC Code
- ISGOTT
- Tanker Safety Guide - Chemicals
- CHRIS Manual

Examination

Advanced Training for Oil and Chemical Tanker Cargo Operations (88145):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Qualification prerequisites for professors/instructors etc.

Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.
  and in accordance with the Danish order no. 1165 of 3 November 2014, as amended
- have practical experience on board tankers at management level and the instructor shall be
  - Associate professor at a maritime academy with specific theoretical and professional knowledge of chemical and oil tankers and their operations acquired as surplus officer on board a chemical and oil tanker
    or
  - Senior ships officer with minimum 2 years of experience on board chemical and oil tankers and trained in teaching.

Syllabus

Subject area:	**88000**	**Subject area (BS/BM/BJ/SE)**		
Subject(s):	88100	Elective Subject		
	88146	Human Factors in Safety		5 ECTS
Admission criteria:				
Criteria to pass subject	These assessments make up the subject: 1. **None** assessments using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding) / To pass the grade must be at least 02. 2. **one** assessments graded Passed/Not Passed. • All assessments must be graded Passed.			
Semester:	BS5 + BS7 + BM5 + BM8 + BJ6 + SKF + MCH + SCH			
ECTS credits:	5			
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (BJ+SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022. • Ship Officer (BJ) Version 6.10, 1 February 2022.			
Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. This order is for students who were registered in BS1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.			

Syllabus

STCW:	None	
Certificate(s):	None	
Qualification prerequisites for professors/instructors etc.	Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.	
Core literature		
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:		

Purpose

The purpose of the course Human Factors in Safety is to prepare the students to participate in human factor investigations in organisations and give the students insight into the factors in play when working with humans. During the past 100-years, significant changes have been made regarding the view on human factors in safety. The subject will provide a comprehensive background on the progression in the safety science field. The course will enable the students to perform investigations on what role human factors plays in everyday work.

Human Factors in Safety

Content:

Learning objectives:

Knowledge:

- Recall and present relevant safety theories, accident models and views on human factors, and their progression over the past decades
- Define phenomena that contribute to the risk of organisational accidents

Skills

- Explain the advancements in human factors theories and their practical use to risk management and organisations' safety problems.
- Identify and recognise judgmental language and quick fixes in investigations

Competencies:

- Communicate and present learnings from incidents with effectiveness and wordings to increase safety in organisations
- Assess accidents and incidents in order of enhancing organisational learning

Learning activities:

- Situation: Large class. Large class activities take place in the classroom setting and consist of a varying mix of lecturing, tutorials and student activity.
- Student centered activities. The student centered activities are aimed at the study groups. The function of the groups may vary during the course such as buzz groups, learning cells, etc.. For student centered activities the assistant or associate professor(s) are available for tutoring, professional guidance, and formative feedback.
    - Individual reading and answering of study questions
    - Role play action in various situations that the master can face
    - Course documentation. The course documentation is the student's reflection on how the learning objectives are reached and is a compliation of theory, workplace practice and context. Some core topics of the course documentation are counting activities and are mandatory to hand in.

Examination

Examination name:	Human Factors in Safety
Examination type:	Ongoing assessment
Grade scale:	Passed/Not Passed
Preparation time:	
Duration:	
Aids allowed:	
Important information:	
Prerequisites for examination:	

Syllabus

Subject area:	**88000**	**Subject area (BS/BM/SE)**		
Subject(s):	88100	Elective Subject		
	88150	Cross-Cultural Leadership		3 ECTS
Admission criteria:	Completed the subject Human Ressource Management (HRM) or attending the subject.			
Criteria to pass subject	These assessments make up the subject: 1. **None** assessments using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding) / To pass the grade must be at least 02. 2. **One** assessments graded Passed/Not Passed. • All assessments must be graded Passed.			
Semester:	BS5 + BS7 + BM5 + BM8 + SE(SKF) +SE(SCH) BM5 (Specialization: Management) + BM5 (Specialization: Automation)			
ECTS credits:	3			
Course Regulations:	• Master Mariner (BS) Version 5.80, 1 February 2021. • Marine Engineer (BM) Version 5.80, 1 February 2021. • Ship Officer (SE) Version 5.80, 1 February 2021. • Master Mariner (BS) Version 6.10, 1 February 2022. • Marine Engineer (BM) Version 6.10, 1 February 2022.			

Orders:	• Order on the professional bachelor training programme for Master Mariner – Danish order no. 1611 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Master Mariner - Danish order no. 1349 of 23 November 2018 as amended. This order is for students who were registered in BS1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Marine Engineer – Danish order no 1610 of 13 December 2016 as amended. • Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. This order is for students who were registered in BM1 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on the professional bachelor training programme for Ship Officer – Danish order no. 1612 of 13 December 2016, as amended. • Order on the professional bachelor training programme for Ship Officer - Danish order no. 1350 of 23 November 2018 as amended. This order is for students who were registered in BJ1, SE1 eller SE2 for first time in the spring of 2019 or later (2019-2, 2020-1 ect.). • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended.	
STCW:	None	
Certificate(s):	None	
Qualification prerequisites for professors/instructors etc.	Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall: • have a qualification level that is the same or higher than the level of learning objectives for the subject and • have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.	
Core literature		
Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	The course replaces “88108 Change Management” from 2021-2.	

Syllabus

Purpose

The purpose of the course Cross-Cultural Leadership is to prepare the students to become leaders in a complex and multinational environment. The focus will be on raising awareness of cultural differences and promoting/supporting collaboration in diverse groups.

Cross-Cultural Leadership:

Content:

Learning objectives:

Knowledge:

Recall and present relevant cultural research

Skills

- Apply cultural theory to build relationships, and to improve personal leadership development
- Set up a work culture that respect and promote individual and cultural differences

Competencies:

- Create a work culture that foster integration and collaboration
- Assess effective use of ressources

Learning activities:

- Large class: Large class activities take place in the classroom setting and consist of a varying mix of lecturing, classroom dialogue and student activity.
- Student centered activities: The student-centered activities are aimed at the study groups. The student shall expect group activities
  - Case studies and analysis
  - Role play and presentations

Examination

Examination name:	
Examination type:	Ongoing assessment
Grade scale:	Passed/Not Passed

Preparation time:	
Duration:	
Aids allowed:	
Important information:	
Prerequisites for examination:	Completed the subject Human Ressource Management (HRM) or attending the subject.

Syllabus

Subject area:	**20850**	**Maritime Elective Subjects – BM5(SØ)**	
Subject(s):	28253	Safety at Work II including §16	2 ECTS
	28213	Elementary First Aid	1 ECTS
	28219	Medical First Aid	
	28217	Basic Training for Oil, Chemical and Gas Tanker Operations	1 ECTS
	28240	Maritime Technology including Maritime English	
	28241	Ship Propulsion	2 ECTS
	28242	Ship Auxiliary and Service Systems	2 ECTS
	28243	Maritime English	2 ECTS
Admission criteria:	Safety at Work	None	
	Elementary First Aid	None	
	Medical First Aid	Passed Elementary First Aid	
	Basic Training for Oil, Chemical and Gas Tanker Operations:	None	
	Ship Propulsion:	Register subjects Ships Propulsion, Ship Auxiliary and Service Systems and Maritime English at the same time	
	Ship Auxiliary and Service systems:	Register subjects Ships Propulsion, Ship Auxiliary and Service Systems and Maritime English at the same time	
	Maritime English:	Register subjects Ships Propulsion, Ship Auxiliary and Service Systems and Maritime English at the same time	
Criteria to pass subject	These assessments make up the subject: 1. **One** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **Four** assessments graded Passed/Not Passed. • All assessments must be graded Passed.		
Semester:	BM5(SØ)		
ECTS credits:	10		

Syllabus

Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended. • Order on training programme for Tanker Operations - order no 1165 2 November 2014, as amended. • Order on safety work in merchant ships (Working environment in ships) - Danish order no. 846 of 25 June 2018.

STCW:	*STCW Code, as amended: Part A, chapter II - Engine department:* Section A-III/1 *STCW Code, as amended: Part A, chapter III - Engine department:* Section A-III/1 - Operational level Section A-III/2 - Management level *STCW Code, as amended: Part A, chapter VI - Emergency, safety, security:* Section A-VI/1, paragraph 2 • Elementary first aid as set in table A-VI/1-3 • Personal safety and social responsibilities as set in table A-VI/1-4 Section A-VI/4, paragraph 1 to 3 • Medical first aid as set in table A-VI/4-1. *STCW Code, as amended: Part A, chapter V - Special training requirements:* Section A-V/1-1-1 • Basic training for oil and chemical tanker as set in table A-V/1-1-1. Section A-V/1-2-1 • Basic training for gas tanker as set in table A-V/1-2-1
Certificate(s):	*Certificate of Proficiency in Medical First Aid* is issued upon completion of the training programme prescribed in Regulation VI/4, paragraph 1 of the STCW Convention of 1978, as amended. *Course Certificate of Training in Safety & Health §16 course* is issued upon completion of the training programme prescribed in the Danish order no. 795 of 2 June 2017, as amended. *Course Certificate of Basic Training for Oil, Chemical and Gas Tanker Cargo Operations* is issued upon completion of the training programme prescribed in Regulation V/1-1, paragraph 2.2 and Regulation V/1-2, paragraph 2.2 of the STCW Convention of 1978, as amended and the Danish order no 1165 2 November 2014, as amended. (”Carry out fire-fighting operations” as set in table A-V/1-1-1 and 1-2-1 of STCW Convention of 1978, as amended)

Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	None	

Purpose

Safety at Work:
During the course, the students must acquire the necessary knowledge, skills and qualifications to work on a merchant vessel as a marine engineer in consideration to own and others safety, according to ship safety management systems and job-related safety assessments.

Basic Training for Oil, Chemical & Gas Tanker Cargo Operations (Tanker Basic):
The purpose of the Tanker Basic course is for the participant to acquire the necessary knowledge, skills and competence to contribute to the safe operation of a tanker and once the SCBA Fire Fighting Course is successfully passed, receive certification of Basic Training in Oil, Chemical and Gas tankers.
The participant shall during the course acquire an understanding of various cargoes and which hazards they present to the occupational health, the ship and the environment. Furthermore, the participant will acquire an understanding of how the construction, cargo systems, equipment and operation of the tanker protect the occupational health and the environment whilst minimizing the risk of fire. Finally, the participant shall acquire understanding of the emergency procedures for and reactions to personal injury, fire and pollution.

Ship Propulsion:
The student shall obtain the necessary knowledge, skills, and competencies for operating a vessel's propulsion system, taking into account the forces and conditions that influence the efficient propulsion of a ship.

Ship Auxiliary and Service Systems:
The student shall obtain the necessary knowledge about tank- and bilge systems, fuel systems incl. separators, lubricating oil systems incl. separators , sewage systems, firefighting systems, inert gas systems, stern tube systems, air-condition systems, fresh water systems and steam systems in order to handle and maintain these systems in a safety and environmentally secure way under normal and abnormal conditions.

Maritime English:
The student shall acquire the qualifications in oral and written English communication necessary to be able to function as an officer on board a merchant ship engaged in international voyages

Learning objectives

Safety at Work II including §16 (28253):

§16 Safety and Health Working Environment:

<u>Knowledge:</u>

- General knowledge about how occupational health can form part of safety management system including procedures for securing on-board health and safety
- Understand the most important occupational health effect on passenger and cargo ships, including the most important work related diseases and occupational accidents.

- Understand the most important tasks performed by the safety organization.
- Developing the attitude of the safety organization towards promoting a safe working environment.
- Accident investigations
- Safety enhancing tools and measures the purpose of which is to promote safe operations.
- Safe working practices in Polar Regions.

Skills:

- Instruct and monitor safe working practices to ensure that the work is conducted with due regard to the risk of accidents and the danger to health.
- Be responsible for toolbox meetings, risk assessments and workplace assessments.
- Show responsibility and commitment in promoting the working environmental effort on board.
- Update the safety organization's knowledge by retrieving information from acts, new safety regulations, material from relevant occupational health services and preventive measures.
- Understand and use rest periods at sea.

Competencies:

- Performance of tasks in the safety organization including consultancy in connection with the solving of occupational health problems in order to prevent and handle occupational health related conflicts.
- Cooperation at all operational levels with focus on securing on-board occupational health.

Safety at Work II including §16 (28253):

Knowledge:

- Assessment of needs of casualties and threats to own safety
- Appreciation of body structure and functions
- Understanding immediate measures to be taken in cases of emergency, including the ability to:
  - Position casualty
  - Apply resuscitation techniques
  - Control bleeding
  - Apply appropriate measures of basic shock management
  - Apply appropriate measures in event of burns scalds, including accidents caused by electric current
  - Rescue and transport a casualty
  - Improvise bandages and use materials in the emergency kit
- Body structure and function
- Fractions, dislocations and muscular injuries
- Spinal injuries
- Mental first aid
- Cardiac arrest, drowning and asphyxia

Skills:

- None

Competencies:

- Take immediate action upon encountering an accident or other medical emergency

Medical First Aid (28219):

Knowledge:

- First-aid Kit
- Body structure and function
- Toxicological hazards, including use of the MFAG for use in accidents involving Dangerous Goods
- Examination of casualty or patient
- Spinal injuries.
- Burns, scalds and effects of heat and cold
- Fractions, dislocations and muscular injuries
- Medical care of rescued persons
- Radio Medical Advice
- Pharmacology
- Sterilization
- Cardiac arrest, drowning and asphyxia

Skills:

- None

Competencies:

- Apply immediate first aid in the event of accident or illness on board

Basic Training for Oil, Chemical & Gas Tanker (28217):

Knowledge:

- Types of oil, chemical and liquefied gas tankers, their equipment and operation
  - Piping systems and valves
  - Cargo pumps
  - Loading and unloading
  - Tank cleaning, purging, gas-freeing and inerting
- Cargos and properties
  - Pressure and temperature, including vapour pressure/temperature relationship
  - Types of electrostatic charge generation
  - Chemical symbols ESD
- Safety culture and management
- Operational cargo hazards and how they are controlled
  - Health hazards
  - Environmental hazards
  - Corrosive hazards
  - Explosive and flammability hazards
  - Sources og ignition, including electrostatic hazards
  - Toxicity hazards
  - Vapour leaks and clouds
  - Extremely low temperatures
  - Pressure hazards
  - Inerting, water padding, drying agents and monitoring techniques
  - Anti-static measures
  - Ventilation
  - Segregation

    - Cargo inhibition
    - Importance of cargo compatibility
    - Atmospheric control
- Contents and purpose of a MSDS
- Safety equipment and PPE
    - Breathing apparatus and tank-evacuating equipment
    - Resuscitators
    - Rescue and escape equipment
- Gas-measuring equipment
- Safe operation of the vessel
- Safe working practices incl. legislation and guidelines
    - Precautions to be taken when entering enclosed spaces
    - Precautions to be taken before and during repair and maintenance work
    - Safety measures for hot and cold work
    - Electrical safety
    - Ship/shore safety check list
- Emergency action in case of injury, fire or spill
    - Reporting to responsible persons
    - SOPEP

Prevention of brittle fractures

- **Skills:**
- Identify and take precautions to prevent hazards
- Apply occupational health and safety precautions and measures
- Take precautions to avoid pollution from cargo
- **Competencies:**
- Contribute to safe operation of tankers

Ship Propulsion (28241):

Knowledge:

- The main components of the propulsion system of a ship
- Various principles of construction of propulsion systems
- The various forces that affect the hull of a ship, leading to resistance against propulsion
- Basic construction principles and modes of operation of fixed pitch propellers and controllable pitch propellers

Skills:

- Operate the propulsion system of a ship in a safe and most efficient way
- Take into account the various possibilities and limitations of different types of propulsion plants

Competencies:

- Carry out performance tests of a propulsion plant, aided by the use of propeller curves, engine load diagrams etc. in order to evaluate, optimize and troubleshoot a propulsion plant.

Ship Auxiliary and Service Systems (28242):

Knowledge:

- Components which typically form pipe systems including shut off valves and control instruments
- Special operation conditions in fluid filled pipe systems as for example liquid shock and cavitation
- MARPOL legislation.

Skills:

- Operate systems for fresh water production and air-conditioning
- Operate systems for production and distribution of inert gas on tanker vessels
- Be able to use one´s knowledge about systems for keeping them well maintained
- Be able to use manuals in connection with fault finding and maintenance
- Act environmentally responsible in the daily routine work.
- Current measures to reduce emissions(NOx, SOx, CO etc.) from a vessel's main and auxiliary machinery.

Competencies:

- Be able to evaluate tank-, bilge and firefighting systems' influence on the stability of the ship and deal with it
- Be able to evaluate the environmental influence of systems especially bilge-, tank-, and sewage systems

Maritime English:

Knowledge:

- Comprehend and use maritime terms relating to the vessel itself as well as to the duties of an officer.
- Be familiar with the IMO Standard Maritime Communication Phrases and various treaties, their purpose and rules.
- Ship knowledge, understanding of types of vessels and their construction.
- Safety and optimum use of energy, as well as new developments in these areas.
- Forms of communication, both oral and written, with the vessel's crew and owners/customers.

Skills:

- Use maritime terminology in daily work and communicate with the crew clearly and effectively.
- Assess daily situations regarding safety, health and environmental protection.
- Decide and implement necessary actions based on the assessment.
- Guide the crew in matters of working environment and environmental protection.

Competencies:

- Use maritime English in daily work.
- Communicate clearly with the crew as well as with shore-based owners, customers, partners and authorities.
- Assess verbal statements and written material received and communicate the essence of both to relevant recipients.

Core literature

Safety at sea and Work:

- Ship Knowledge - Dokmar Maritime Puplishers B.V.
- Søfartens ABC - Iver C. Weilbach.
- Note: All books must be the latest edition.

Ship Auxiliary and Service Systems:

The International Maritime Language Programme by P.C. van Kluijven together with various relevant articles, and key chapters of Ship Knowledge by K. van Dokkum.

Maritime English:

The International Maritime Language Program af P.C. van Kluijven samt diverse relevante artikler

Examination

Safety at Work II including §16 (28253):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Elementary First Aid (28213):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Medical First Aid (28219):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Basic Training for Oil, Chemical & Gas Tanker (28217):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Maritime Technology including Maritime English (28240):

Examination type:	Internal oral test
Grading scale:	7-point scale
Preparation time:	None
Duration:	60 minutes for each group of 4 students
Aids allowed:	All

Important Information:	Ship Propulsion, Ship Auxiliary and Service Systems and Maritime English are examined together. The student receives one grade. The examination is based on an interdisciplinary case handed in by the study group. Each student prepares 5 minutes pitch, and the students are then cross-examined in relevant topics of the case, and other learning objectives of the subject.
Prerequisites for Examination:	The study group must hand in the interdisciplinary case in accordance with the lesson plan.

Qualification prerequisites for professors/instructors etc.

Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is the same or higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

In accordance with the Danish order no. 765 of 22 June 2017 the instructors of §16 safety and health working environment courses shall have completed a training programme for teachers of working environment approved by the Danish Maritime Authority.

Instructors of Elementary First Aid courses shall have completed a training programme for teachers of First Aid approved by the Danish First Aid Council.

Syllabus

Subject area:	**20850**	**Maritime Elective Subjects – BM5(SØ)**	
Subject(s):	28253	Safety at Work II including §16	2 ECTS
	28213	Elementary First Aid	1 ECTS
	28219	Medical First Aid	
	28217	Basic Training for Oil, Chemical and Gas Tanker Operations	1 ECTS
	28240	Maritime Technology including Maritime English	
	28241	Ship Propulsion	2 ECTS
	28242	Ship Auxiliary and Service Systems	2 ECTS
	28243	Maritime English	2 ECTS
Admission criteria:	Safety at Work	None	
	Elementary First Aid	None	
	Medical First Aid	Passed Elementary First Aid	
	Basic Training for Oil, Chemical and Gas Tanker Operations:	None	
	Ship Propulsion:	Register subjects Ships Propulsion, Ship Auxiliary and Service Systems and Maritime English at the same time	
	Ship Auxiliary and Service systems:	Register subjects Ships Propulsion, Ship Auxiliary and Service Systems and Maritime English at the same time	
	Maritime English:	Register subjects Ships Propulsion, Ship Auxiliary and Service Systems and Maritime English at the same time	
Criteria to pass subject	These assessments make up the subject: 1. **One** assessment using the 7-point grade scale. • To pass the average of the assessments must be at least 2.0. (no rounding). 2. **Four** assessments graded Passed/Not Passed. • All assessments must be graded Passed.		
Semester:	BM5(SØ)		
ECTS credits:	10		

Syllabus

Course Regulations:	• Marine Engineer (BM) version 6.10, 1 February 2022.
Orders:	• Order on the professional bachelor training programme for Marine Engineer - Danish order no. 1348 of 23 November 2018 as amended. • Order on tests in the maritime training programmes – Danish order no 1585 of 13 December 2016, as amended. • Order on grading scale and other examination – Danish order no 114 of 3 February 2015, as amended. • Order on training programme for Tanker Operations - order no 1165 2 November 2014, as amended. • Order on safety work in merchant ships (Working environment in ships) - Danish order no. 846 of 25 June 2018.

STCW:	*STCW Code, as amended: Part A, chapter II - Engine department:* Section A-III/1 *STCW Code, as amended: Part A, chapter III - Engine department:* Section A-III/1 - Operational level Section A-III/2 - Management level *STCW Code, as amended: Part A, chapter VI - Emergency, safety, security:* Section A-VI/1, paragraph 2 • Elementary first aid as set in table A-VI/1-3 • Personal safety and social responsibilities as set in table A-VI/1-4 Section A-VI/4, paragraph 1 to 3 • Medical first aid as set in table A-VI/4-1. *STCW Code, as amended: Part A, chapter V - Special training requirements:* Section A-V/1-1-1 • Basic training for oil and chemical tanker as set in table A-V/1-1-1. Section A-V/1-2-1 • Basic training for gas tanker as set in table A-V/1-2-1
Certificate(s):	*Certificate of Proficiency in Medical First Aid* is issued upon completion of the training programme prescribed in Regulation VI/4, paragraph 1 of the STCW Convention of 1978, as amended. *Course Certificate of Training in Safety & Health §16 course* is issued upon completion of the training programme prescribed in the Danish order no. 795 of 2 June 2017, as amended. *Course Certificate of Basic Training for Oil, Chemical and Gas Tanker Cargo Operations* is issued upon completion of the training programme prescribed in Regulation V/1-1, paragraph 2.2 and Regulation V/1-2, paragraph 2.2 of the STCW Convention of 1978, as amended and the Danish order no 1165 2 November 2014, as amended. (”Carry out fire-fighting operations” as set in table A-V/1-1-1 and 1-2-1 of STCW Convention of 1978, as amended)

Responsible:	Subject Manager	
Valid from:	2022-1	EIN
Expired:		
Remarks:	None	

Purpose

Safety at Work:
During the course, the students must acquire the necessary knowledge, skills and qualifications to work on a merchant vessel as a marine engineer in consideration to own and others safety, according to ship safety management systems and job-related safety assessments.

Basic Training for Oil, Chemical & Gas Tanker Cargo Operations (Tanker Basic):
The purpose of the Tanker Basic course is for the participant to acquire the necessary knowledge, skills and competence to contribute to the safe operation of a tanker and once the SCBA Fire Fighting Course is successfully passed, receive certification of Basic Training in Oil, Chemical and Gas tankers.
The participant shall during the course acquire an understanding of various cargoes and which hazards they present to the occupational health, the ship and the environment. Furthermore, the participant will acquire an understanding of how the construction, cargo systems, equipment and operation of the tanker protect the occupational health and the environment whilst minimizing the risk of fire. Finally, the participant shall acquire understanding of the emergency procedures for and reactions to personal injury, fire and pollution.

Ship Propulsion:
The student shall obtain the necessary knowledge, skills, and competencies for operating a vessel's propulsion system, taking into account the forces and conditions that influence the efficient propulsion of a ship.

Ship Auxiliary and Service Systems:
The student shall obtain the necessary knowledge about tank- and bilge systems, fuel systems incl. separators, lubricating oil systems incl. separators , sewage systems, firefighting systems, inert gas systems, stern tube systems, air-condition systems, fresh water systems and steam systems in order to handle and maintain these systems in a safety and environmentally secure way under normal and abnormal conditions.

Maritime English:
The student shall acquire the qualifications in oral and written English communication necessary to be able to function as an officer on board a merchant ship engaged in international voyages

Learning objectives

Safety at Work II including §16 (28253):

§16 Safety and Health Working Environment:

<u>Knowledge:</u>

- General knowledge about how occupational health can form part of safety management system including procedures for securing on-board health and safety
- Understand the most important occupational health effect on passenger and cargo ships, including the most important work related diseases and occupational accidents.

- Understand the most important tasks performed by the safety organization.
- Developing the attitude of the safety organization towards promoting a safe working environment.
- Accident investigations
- Safety enhancing tools and measures the purpose of which is to promote safe operations.
- Safe working practices in Polar Regions.

Skills:

- Instruct and monitor safe working practices to ensure that the work is conducted with due regard to the risk of accidents and the danger to health.
- Be responsible for toolbox meetings, risk assessments and workplace assessments.
- Show responsibility and commitment in promoting the working environmental effort on board.
- Update the safety organization's knowledge by retrieving information from acts, new safety regulations, material from relevant occupational health services and preventive measures.
- Understand and use rest periods at sea.

Competencies:

- Performance of tasks in the safety organization including consultancy in connection with the solving of occupational health problems in order to prevent and handle occupational health related conflicts.
- Cooperation at all operational levels with focus on securing on-board occupational health.

Safety at Work II including §16 (28253):

Knowledge:

- Assessment of needs of casualties and threats to own safety
- Appreciation of body structure and functions
- Understanding immediate measures to be taken in cases of emergency, including the ability to:
  - Position casualty
  - Apply resuscitation techniques
  - Control bleeding
  - Apply appropriate measures of basic shock management
  - Apply appropriate measures in event of burns scalds, including accidents caused by electric current
  - Rescue and transport a casualty
  - Improvise bandages and use materials in the emergency kit
- Body structure and function
- Fractions, dislocations and muscular injuries
- Spinal injuries
- Mental first aid
- Cardiac arrest, drowning and asphyxia

Skills:

- None

Competencies:

- Take immediate action upon encountering an accident or other medical emergency

Medical First Aid (28219):

Knowledge:

- First-aid Kit
- Body structure and function
- Toxicological hazards, including use of the MFAG for use in accidents involving Dangerous Goods
- Examination of casualty or patient
- Spinal injuries.
- Burns, scalds and effects of heat and cold
- Fractions, dislocations and muscular injuries
- Medical care of rescued persons
- Radio Medical Advice
- Pharmacology
- Sterilization
- Cardiac arrest, drowning and asphyxia

Skills:

- None

Competencies:

- Apply immediate first aid in the event of accident or illness on board

Basic Training for Oil, Chemical & Gas Tanker (28217):

Knowledge:

- Types of oil, chemical and liquefied gas tankers, their equipment and operation
  - Piping systems and valves
  - Cargo pumps
  - Loading and unloading
  - Tank cleaning, purging, gas-freeing and inerting
- Cargos and properties
  - Pressure and temperature, including vapour pressure/temperature relationship
  - Types of electrostatic charge generation
  - Chemical symbols ESD
- Safety culture and management
- Operational cargo hazards and how they are controlled
  - Health hazards
  - Environmental hazards
  - Corrosive hazards
  - Explosive and flammability hazards
  - Sources og ignition, including electrostatic hazards
  - Toxicity hazards
  - Vapour leaks and clouds
  - Extremely low temperatures
  - Pressure hazards
  - Inerting, water padding, drying agents and monitoring techniques
  - Anti-static measures
  - Ventilation
  - Segregation

    - Cargo inhibition
    - Importance of cargo compatibility
    - Atmospheric control
- Contents and purpose of a MSDS
- Safety equipment and PPE
    - Breathing apparatus and tank-evacuating equipment
    - Resuscitators
    - Rescue and escape equipment
- Gas-measuring equipment
- Safe operation of the vessel
- Safe working practices incl. legislation and guidelines
    - Precautions to be taken when entering enclosed spaces
    - Precautions to be taken before and during repair and maintenance work
    - Safety measures for hot and cold work
    - Electrical safety
    - Ship/shore safety check list
- Emergency action in case of injury, fire or spill
    - Reporting to responsible persons
    - SOPEP

Prevention of brittle fractures

- **Skills:**
- Identify and take precautions to prevent hazards
- Apply occupational health and safety precautions and measures
- Take precautions to avoid pollution from cargo
- **Competencies:**
- Contribute to safe operation of tankers

Ship Propulsion (28241):

Knowledge:

- The main components of the propulsion system of a ship
- Various principles of construction of propulsion systems
- The various forces that affect the hull of a ship, leading to resistance against propulsion
- Basic construction principles and modes of operation of fixed pitch propellers and controllable pitch propellers

Skills:

- Operate the propulsion system of a ship in a safe and most efficient way
- Take into account the various possibilities and limitations of different types of propulsion plants

Competencies:

- Carry out performance tests of a propulsion plant, aided by the use of propeller curves, engine load diagrams etc. in order to evaluate, optimize and troubleshoot a propulsion plant.

Ship Auxiliary and Service Systems (28242):

Knowledge:

- Components which typically form pipe systems including shut off valves and control instruments
- Special operation conditions in fluid filled pipe systems as for example liquid shock and cavitation
- MARPOL legislation.

Skills:

- Operate systems for fresh water production and air-conditioning
- Operate systems for production and distribution of inert gas on tanker vessels
- Be able to use one´s knowledge about systems for keeping them well maintained
- Be able to use manuals in connection with fault finding and maintenance
- Act environmentally responsible in the daily routine work.
- Current measures to reduce emissions(NOx, SOx, CO etc.) from a vessel's main and auxiliary machinery.

Competencies:

- Be able to evaluate tank-, bilge and firefighting systems' influence on the stability of the ship and deal with it
- Be able to evaluate the environmental influence of systems especially bilge-, tank-, and sewage systems

Maritime English:

Knowledge:

- Comprehend and use maritime terms relating to the vessel itself as well as to the duties of an officer.
- Be familiar with the IMO Standard Maritime Communication Phrases and various treaties, their purpose and rules.
- Ship knowledge, understanding of types of vessels and their construction.
- Safety and optimum use of energy, as well as new developments in these areas.
- Forms of communication, both oral and written, with the vessel's crew and owners/customers.

Skills:

- Use maritime terminology in daily work and communicate with the crew clearly and effectively.
- Assess daily situations regarding safety, health and environmental protection.
- Decide and implement necessary actions based on the assessment.
- Guide the crew in matters of working environment and environmental protection.

Competencies:

- Use maritime English in daily work.
- Communicate clearly with the crew as well as with shore-based owners, customers, partners and authorities.
- Assess verbal statements and written material received and communicate the essence of both to relevant recipients.

Core literature

Safety at sea and Work:

- Ship Knowledge - Dokmar Maritime Puplishers B.V.
- Søfartens ABC - Iver C. Weilbach.
- Note: All books must be the latest edition.

Ship Auxiliary and Service Systems:

The International Maritime Language Programme by P.C. van Kluijven together with various relevant articles, and key chapters of Ship Knowledge by K. van Dokkum.

Maritime English:

The International Maritime Language Program af P.C. van Kluijven samt diverse relevante artikler

Examination

Safety at Work II including §16 (28253):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Elementary First Aid (28213):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Medical First Aid (28219):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Basic Training for Oil, Chemical & Gas Tanker (28217):

Examination type:	Ongoing assessment
Grading scale:	Passed or Not Passed
Preparation time:	None
Duration:	N/A
Aids allowed:	N/A
Important Information:	None
Prerequisites for Examination:	None

Maritime Technology including Maritime English (28240):

Examination type:	Internal oral test
Grading scale:	7-point scale
Preparation time:	None
Duration:	60 minutes for each group of 4 students
Aids allowed:	All

Important Information:	Ship Propulsion, Ship Auxiliary and Service Systems and Maritime English are examined together. The student receives one grade. The examination is based on an interdisciplinary case handed in by the study group. Each student prepares 5 minutes pitch, and the students are then cross-examined in relevant topics of the case, and other learning objectives of the subject.
Prerequisites for Examination:	The study group must hand in the interdisciplinary case in accordance with the lesson plan.

Qualification prerequisites for professors/instructors etc.

Associate professors, assistant professors or instructors intended to be used in qualifying for certification under the STCW convention of 1978 as amended shall:

- have a qualification level that is the same or higher than the level of learning objectives for the subject
  and
- have a full understanding of the subject-training programme and the specified objectives for each type of training being conducted.

In accordance with the Danish order no. 765 of 22 June 2017 the instructors of §16 safety and health working environment courses shall have completed a training programme for teachers of working environment approved by the Danish Maritime Authority.

Instructors of Elementary First Aid courses shall have completed a training programme for teachers of First Aid approved by the Danish First Aid Council.