Part C

Course Syllabus

The course syllabus has been written in learning outcome format in which the outcome describes what the trainee must do to demonstrate that the specified knowledge or skill has been acquired and the proper attitude has been developed. All the outcomes are understood to be prefixed by the words, "At the end of the session, the trainees should be able to …"

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
Course Introduction .1 explain the requirements under Regulation III/2, Section A-III/2 Function 1 of the STCW Convention and Code. .2 explain the training outcomes and course requirements. .3 explain the leadership skill that a management level officer should possess.	R1	A1
Competence: Manage the operation of propulsion plant machinery		
1. Design features, and operative mechanism of marine diesel engine, marine steam turbine, marine gas turbine, and marine steam boiler .1 explain the design features and operative mechanism of the following machinery and associated auxiliaries in accordance with operation manual: – marine diesel engine – marine steam turbine – marine gas turbine – marine steam boiler	B12, B15, B16, B11, B3, B14	A1, A2, A4
Competence: Plan and schedule operations		
2. Planning the start-up and shut down of main and auxiliary	R2, R3, B1, B15	A1, A2, A4, A5, A6

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
machinery, including associated system **2.1 Prior departure** **2.1.1 Legislative Requirements** .1 explain the applicable legislative requirements and general company requirements necessary prior departure. .2 supervise the function test of all critical equipment and machinery based on general company requirements and instruction manual. .3 explain the reportorial requirements prior departure in accordance with general company requirements. **2.1.2 Planning the operational requirements of main machinery (Diesel Engine) and associated systems** .1 explain the factors that must be considered in the start-up of diesel engine and associated systems. .2 plan the starting up of main diesel engine and associated systems in accordance with general company requirements in a given scenario. **2.2 Prior arrival** **2.2.1 Legislative Requirements**		A7.1 A7.2

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
.1 explain the applicable legislative requirements and general company requirements necessary prior arrival. .2 explain the reportorial requirements prior arrival in accordance with general company requirements. **2.2.2 Planning the operational requirements of main machinery (Diesel Engine) and associated systems** .1 explain the factors that must be considered in shutting down the diesel engine and associated systems. .2 plan the shutting down of diesel engine and associated systems in accordance with general company requirements in a given scenario.		A7.3
3. Planning of efficient operation and performance assessment of propulsion plant and auxiliary machinery **3.1 Efficient Operation** .1 explain the ship's energy efficiency management plan in accordance with company requirements. .2 plan a ship's energy efficiency in accordance with company Ship's Energy Efficiency	B1, B15	A1, A2, A5 A7.4

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
Management Plan (SEEMP) in a given scenario. **3.2 Performance Assessment** .1 explain the methods of planning a performance assessment of main propulsion plant and auxiliary machinery in accordance with company requirements. .2 plan the performance assessment of main propulsion plant and auxiliary machinery in accordance with company requirements in a given scenario.		A7.5
Competence: Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery		
4. Start up and shut down main propulsion and auxiliary machinery, including associated systems **.1 Start-up of Main Diesel Engine and auxiliary machinery including associated systems** .1 explain the proper management in preparing for the start-up of main diesel engine in accordance with company requirements and safe working practices. .2 explain the process of determining the availability of fuels, lubricants, cooling water, and air in accordance with company requirements. .3 manage the preparation of	B1, B15	A1, A2, A4 A7.6

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
main diesel engine for the start up and make available fuels, lubricants, cooling water, and air in accordance with company requirements in a given scenario.		
.4 supervise the checking of the pressures, temperatures, and revolutions during the start-up and warm-up period in accordance with safe working practices and agreed work plans through a given scenario.		A7.7
.5 explain the procedure for conducting surveillance of main diesel engine and its associated auxiliary in accordance with company requirements.		
.6 conduct surveillance of main diesel engine and its associated auxiliary systems to maintain safe operating conditions in accordance with company requirements in a given scenario.		A7.8
.7 explain the procedure in checking the performance of main diesel engine and associated systems in accordance with bridge orders and technical specifications.		
.8 check the performance of main diesel engine and associated system in accordance with bridge orders and technical		A7.9

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
specifications in a given scenario.		
.2 Shutting down of Main Diesel Engine and auxiliary machinery including associated systems		
.1 explain the proper management in preparing for the shut-down of main diesel engine in accordance with company requirements and safe working practices.		
.2 supervise the preparation of the main diesel engine for the shutting and cooling down operation in accordance with company requirements in a given scenario.		A7.10
.3 explain the procedure in conducting surveillance of the shutting down of main diesel engine and its associated auxiliary systems to maintain safe operating conditions in accordance with company requirements.		
.4 conduct surveillance of the shutting down of main diesel engine and its associated auxiliary systems to maintain safe operating conditions in accordance with company requirements in a given scenario.		A7.11
5. Operating Limits of Propulsion Plant	B15	A1, A2, A4
.1 explain the factors to be		

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considered in specifying the operating limits of propulsion plant in accordance with operating manual.		
.2 supervise the checking of the condition of the main diesel engine if within the operating limits in a given scenario		A7.12
6. The efficient operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery	B15	A1, A2, A4, A5, A6
.1 explain the conduct of surveillance in checking the efficient operation of main diesel engine and auxiliary machinery in accordance with technical specifications.		
.2 conduct surveillance in checking the efficient operation of main diesel engine and auxiliary machinery in accordance with technical specifications in a given scenario.		A7.13
.3 explain the methods of assessing performance of main diesel engine and auxiliary machinery in accordance with technical specifications.		
.4 assess the performance of main diesel engine and auxiliary machinery in accordance with technical specifications in a given scenario.		A7.14
.5 explain the methods of measuring the load capacity of main diesel, engine and auxiliary machinery in accordance with technical specifications.		

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.6 verify the load capacity of main diesel engine and auxiliary machinery using various methods in accordance with technical specifications in a given scenario.		A7.15
.7 explain the frequency of surveillance of main diesel engine and auxiliary systems to maintain safe operating conditions in accordance with technical specifications.		
.8 explain the methods of maintaining safety of main diesel engine and auxiliary machinery in accordance with safe working practices and technical specifications.		
.9 supervise the operation of the main diesel engine and auxiliary machinery to maintain safety in accordance with safe working practices and technical specifications in a given scenario.		A7.16
7. Functions and Mechanism of Automatic Control for Main Engine	B2, B4, B5, B6, B7, B8, B13, B15, B17	A1, A2, A4
7.1 Diesel Engine		
.1 explain the function and mechanism of automatic control of main engine to maintain safe operating conditions.		
.2 explain the method in conducting surveillance and performance check of automatic control system for main engine to maintain safe operating conditions in accordance with manufacturer's manual.		

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.3 supervise the conduct of surveillance and performance check of automatic control system for main engine to maintain safe operating conditions in accordance with manufacturer's manual in a given scenario.		A7.17
8. Functions and Mechanism of Automatic Control for Auxiliary Machinery .1 explain the functions and mechanism of automatic control for the following auxiliary machinery to maintain safe operating conditions: - generator distribution systems - steam boilers - oil purifier - refrigeration system - pumping and piping systems - cargo-handling equipment and deck machinery .2 explain the method in conducting surveillance and performance check of automatic control for the following auxiliary machinery to maintain safe operating conditions: - generator distribution systems - steam boilers - oil purifier - refrigeration system - pumping and piping systems - cargo-handling equipment and deck machinery	B1, B8, B9, B15	A1, A2, A4
.3 supervise the conduct of surveillance and performance check of automatic control for the following auxiliary machinery to maintain safe operating conditions		A7.18

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
in a given scenario: - generator distribution systems - steam boilers - oil purifier - refrigeration system - pumping and piping systems - cargo-handling equipment and deck machinery		
Competences: Plan and schedule operations and Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery		
9. Marine Steam Turbine **9.1 Operating limits of marine steam turbine propulsion plant** .1 explain the operating limits of marine steam turbine propulsion plant with respect to: - pressure - temperature - revolution - speed - power output - torque .2 check the operating limits of marine steam turbine propulsion plant during start up and warm up period in accordance with technical specification and agreed work plan. .3 analyze the result from the checked parameters and take appropriate actions. **9.2 Function and mechanism of automatic control for marine steam turbine propulsion plant** .1 explain the function and mechanism of the following	R5, B2, B12, B15,	A1, A2, A3 A4, A5, A6 A7.19 A7.20

Topics / Learning Outcomes	Reference/ Bibliography	Teaching Aid
automatic controls - rpm control - program control - direct control - lever control - nozzle lift control		
9.3 Surveillance, performance assessment and maintaining safety of marine steam turbine propulsion plant		
.1 explain the procedures in conducting surveillance and performance assessment to maintain safe operating condition.		
.2 conduct surveillance and performance assessment using the gathered data.		A7.21
.3 analyze the result of surveillance and performance assessment conducted and take appropriate actions in accordance with technical specifications and agreed work plan.		A7.22
Competence: Manage fuel, lubrication and ballast operations		
10. Operation and maintenance of machinery, including pumps and piping system	R4, B1, B7, B15	A1, A2, A5
.1 explain the operational requirements in carrying out fuel and ballast operations in accordance with safe working practices.		
.2 manage the carrying out of fuel and ballast operations in accordance with safe working practices so as to prevent pollution of the marine environment in a given scenario.		A7.23