Part C
Course Syllabus

The course syllabus has been written in learning outcomes 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 II/2, Section A-II/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: Plan a voyage and conduct navigation		
1. Voyage planning and navigation for all conditions .1 explain the voyage planning and navigation for all conditions in accordance with the established procedure. .2 evaluate the planned route with due consideration to the following, in a given scenario: • restricted waters; • meteorological conditions; • ice; • restricted visibility; • traffic separation schemes; • vessel traffic service (VTS) areas; and • areas of extensive tidal effects.	R1, R2, R3, R4, R6, B1, B3, B5, B6, B7, B10, B11, B15, B16, B20, B21	A1, A2, A3, A4, A5 A6.1

2. Routeing in accordance with the General Provisions on Ships' Routeing .1 validate the waypoints, courses, distances and time (in hours) calculations are within accepted standards for navigational equipment. .2 identify all the potential navigational hazards in accordance with the General Provisions on Ships' Routeing.	R1, R2, R4, R7, B5, B6, B7, B8, B10, B19, B20, B21	A1, A2, A3, A4, A5
3. Reporting in accordance with the General principles for Ship Reporting Systems and with VTS procedures .1 explain the reporting requirements for particular reporting and VTS systems. .2 evaluate the developed reports in accordance with published procedures and criteria. .3 apply the approved reports in accordance with the published procedures and criteria.	R1, R3, R5, R6, B8, B10, B13, B21	A1, A2, A3, A4, A5 A6.2
Competence: Determine position and the accuracy of resultant position fix by any means		
4. Position determination in all conditions .1 determine the most appropriate ship's position-fixing method to the prevailing circumstances and conditions in a given scenario: • celestial observation; • terrestrial observation; and • electronic navigational aids.	R1, B5, B6, B8, B10, B19, B20, B21	A1, A3, A4, A5, A6.3

Competence: Determine and allow for compass errors		
5. Errors of the magnetic and gyro-compasses .1 evaluate the computed magnetic errors of a ship corresponding to different headings at a given navigational area. .2 evaluate the Gyro-Error by comparing the ship's heading to bearing of range or leading marker/lights of a terrestrial object within an acceptable limit of +/- 1.0 degree to get the true bearing. .3 evaluate the True Bearing of an object by applying the errors appropriate to the ship's magnetic and gyro compasses, within an acceptable limit of +/- 1 degree. .4 evaluate the True Course of a ship by applying the errors appropriate to her magnetic and gyro compasses, within an acceptable limit of +/- 1 degree. .5 apply the true course/direction of own ship and frequently check magnetic and gyro compass errors in the prevailing circumstances and conditions in a given scenario.	R1, B6, B14, B22	A1, A3, A4, A5 A6.4
6. Principles of magnetic and gyro compasses .1 explain the fundamental principles governing magnetic and gyro compass systems, including their operational mechanisms, errors, and corrective measures. .2 determine the factors affecting magnetic and gyro compass performances.	R1, B6, B14, B22	A1, A3, A4, A5
7. Systems under the control of the master gyro, and operation and care of the main types of gyro-compass .1 explain the operation and handling of the main types of gyro-compasses to distinguish key features and functionalities.	R1, B22	A1, A3, A4

.2 explain the importance of routine checks, calibration procedures, and adherence to manufacturer's guidelines to ensure optimal performance. .3 identify the common problems and potential issues related to gyro-compass functionality that may arise during navigation in accordance with operations manual.		
Competence: Coordinate search and rescue operations		
8. Procedures contained in the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual .1 determine the appropriate search and rescue procedures which in accordance with international guidance and standards. .2 analyze in the sample established radiocommunications to ensure that correct communication procedures will be followed at all stages of the search and rescue operations. .3 apply the search and rescue operation coordination procedure of IAMSAR in a given scenario.	R1, R5, B6, B7, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4 A6.5
Competence: Establish watchkeeping arrangements and procedure		
9. **Content, application and intent of the International Regulations for Preventing Collisions at Sea, 1972, as amended** .1 analyze the application of the different parts, sections, rules and annexes of the COLREGs in establishing watchkeeping arrangement and procedures.	R1, R2	A1, A2, A3, A4
10. **Content, application and intent of the Principles to be observed in keeping a navigational watch** .1 explain the international regulations and guidelines for ensuring fitness for duty is in	R1, R2, R7, B10, B17, B19, B20	A1, A3, A4, A5

compliance with the requirements of Chapter VIII, Standards regarding watchkeeping, Section A-VIII/1. .2 analyze the sample watchkeeping arrangement and principles to be observed in compliance with the requirements of Chapter VIII, Standards regarding watchkeeping, Section A-VIII/2.		
Competence: Maintain safe navigation through the use of information from navigation equipment and systems to assist command decision making		
11. **System errors and operational aspects of navigational systems** .1 analyze the operational aspects of the Radar/ARPA and other navigational systems in respect to the information obtained taking into account the limitation of equipment and prevailing circumstances and conditions in a given scenario. .2 analyze the possible system errors that might occur while using the Radar/ARPA and other navigational systems, and measures to correct them in accordance with the operations manual in a given scenario.	R1, R4, B19	A1, A3, A4 A6.6 A6.6
12. **Blind pilotage planning** .1 analyze the navigation of the ship in blind pilotage/zero visibility in accordance with established watchkeeping procedures. .2 perform the blind pilotage safely in accordance with established watchkeeping procedures in a given scenario.	R1, R2, R5, B7, B9, B10, B11, B17 B19, B21	A1, A2, A3, A4, A5 A6.7
13. **Navigational information derived from all sources** .1 evaluate the navigational information derived from applicable navigational equipment, including radar/ARPA, and other navigational information sources to avoid a close-quarter situations with other ships.	R1, R2, B10, B17, B19, B21	A1, A3, A4

.2 perform the safe navigation to avoid a close encounter or collision with another vessel in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended.		A6.8
14. **The interrelationship and optimum use of all navigational data available for conducting navigation**	R1, R2,B1, B5, B6, B9, B10, B12, B17, B20	A1, A2, A3, A4
.1 use all the navigational data derived from navigational equipment for conducting safe navigation in accordance with the established watchkeeping procedures in a given scenario.		A6.8
Competence: Maintain the safety of navigation through the use of ECDIS and associated navigation systems to assist command decision making		
15. **Management of operational procedures, system files and data**	R1	A1, A3, A4, A5
.1 explain the management of operational procedures, system files and data, including: • manage procurement, licensing and updating of chart data and system software to conform to established procedures • system and information updating, including the ability to update ECDIS system version in accordance with vendor's product development		
.2 create and maintain the following in accordance with the established procedure: • system configuration and backup files; • log files; and • route plan files.		A6.9
.3 use the ECDIS log-book and track history functions for inspection of system functions, alarm settings and user responses.		A6.9

16. **ECDIS playback functionality** .1 analyze the ECDIS playback functionality for passage review, route plan and review of system functions. .2 perform the ECDIS playback functionality for passage review, route plan and review of system functions.	R1	A1, A3, A4, A5 A6.10
Competence: Forecast weather and oceanographic conditions		
17. **Synoptic chart and forecast area weather** .1 explain the importance of interpreting a synoptic chart and to forecast area weather, taking into account local weather conditions and information received by weather fax. .2 forecast likely weather conditions for a determined period based on all available information.	R1, B2, B5, B11, B15, B21	A1, A2, A3 A6.11
18. **Characteristics of various weather systems** .1 explain the specific characteristics of tropical revolving storms, including formation, development and intensification, to make informed decisions on storm avoidance. .2 identify the dangerous quadrants/semi-circle of tropical revolving storms in the northern and southern hemispheres. .3 determine the appropriate actions to avoid storm centers and dangerous quadrants to ensure ship's safety in accordance with the established procedures.	R1, B2, B7, B11, B15, B21	A1, A2, A3
19. **Ocean current systems** .1 explain the ocean current systems, including their causes, characteristics, and variations in different geographical regions. .2 interpret the impact of ocean currents on maritime operations, considering their	R1, B2, B6, B7, B11, B15, B21	A1, A2, A3

influence on ship navigation and overall safety. .3 analyze the sample ocean currents to optimize route planning and enhance overall navigation efficiency.		
20. **Tidal conditions** .1 analyze the tidal conditions of a port with the use of tide tables. .2 validate the calculated tidal condition of a secondary port with the use of tide tables in a given scenario.	R1, B2, B6, B7, B11, B15, B21	A1, A2, A3 A6.12
21. **Nautical publications on tides and currents** .1 analyze the ocean current(s) and tides, and its effects on a predetermined route using appropriate nautical publications. .2 use the appropriate nautical publications on tides and currents when passing through ocean routes in a given scenario.	R1, B2, B6, B7, B11, B15, B21	A1, A2, A3 A6.13
Competence: Manoeuvre and handle the ship in all conditions		
22. **Manoeuvring and handling a ship in all conditions** 22.1 **Approaching pilot stations and embarking or disembarking pilots** .1 evaluate the ship's manoeuvring and engine characteristic and the forces such as weather conditions, tides, head reach, and stopping distances prior approaching and departing pilot station under all conditions. .2 manoeuvre the ship to embark and disembark pilots in various conditions of loading (loaded and ballast) and weather in accordance with the established procedures in a given scenario.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.14

22.2 **Handling ship in rivers, estuaries and restricted water** .1 explain the effects of current and wind for the safe handling of ships in rivers, estuaries, and restricted waters in the intended track of the vessel. .2 manoeuvre the ship in rivers, estuaries and restricted water in various conditions of loading (loaded and ballast) and weather in accordance with the established procedures in a given scenario.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.15
22.3 **Application of constant-rate-of-turn techniques** .1 explain the constant-rate-of-turn effects of ship's manoeuvring characteristics and turn techniques under various conditions of loading (loaded and ballast) and weather. .2 manoeuvre the ship using constant-rate-of-turn techniques under various conditions of loading (loaded and ballast) and weather in a given scenario.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.16
22.4 **In shallow water and under-keel clearance** .1 analyze the given changes in dynamic under-keel clearance when manoeuvring the vessel in shallow water, under various conditions of loading and weather. .2 manoeuvre the ship in shallow water including the reduction in under-keel clearance caused by squat, rolling and pitching under various conditions of loading and weather in a given scenario.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.17

22.5 **Interaction between passing ships and between own ship and nearby banks (canal effect)**	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5
.1 explain the effect of the interaction between passing ships and between own ship and nearby banks (bank cushion and suction effect).		
.2 manoeuvre the ship when passing close to other ships and nearby banks, considering canal effect, in accordance with the established procedures in a given scenario.		A6.18
22.6 **Berthing and unberthing in all conditions**	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5
.1 analyze the given ship handling movements when berthing and unberthing with respect to ship's manoeuvring and engine characteristics, with and without tugs assistance, under various conditions of loading (loaded and ballast) and weather.		
.2 perform the berthing and unberthing of the ship, with and without tugs, under various conditions of loading (loaded and ballast) and weather.		A6.19
22.7 **Ship and tug interaction**	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5
.1 analyze the risks and dangers related to ship and tug interaction, as well as factors and precautions that must be considered in a given scenario.		A6.20
.2 perform the ship handling as per ship's manoeuvring and engine characteristics considering external forces to be expected during ship and tug interaction in a given scenario.		A6.20

22.8 **Propulsion and manoeuvring systems** .1 explain the factors to be considered with the use of propulsion and manoeuvring systems during ship handling under various conditions of loading (loaded and ballast) and weather. .2 perform the ship handling using available propulsion and manoeuvring systems under various conditions of loading (loaded and ballast) and weather in accordance with the established procedures.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.21
22.9 **Anchoring** .1 explain the factors such as, but not limited to, appropriate anchorage area, water depth, nature of seabed, direction and speed of approach, and weather condition to be considered when anchoring. .2 perform the ship anchoring in accordance with the established procedures in a given scenario.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.22
22.10 **Dragging anchor** .1 explain how to detect the dragging anchor and appropriate measures to take when dragging anchor/s in accordance with the established procedures. .2 explain the factors and situations leading to fouled anchor/s and appropriate measures in accordance with the established procedures. .3 perform the actions to be taken when dragging anchor in accordance with the established procedures in a given scenario.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.22

22.11 **Dry-docking** .1 evaluate the given manoeuvring plan and handling of ship when approaching a shipyard for dry-docking with and without damage. .2 manoeuvre the ship when approaching a shipyard for dry-docking with and without damage in accordance with the established procedures.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.23
22.12 **Management and handling of ships in heavy weather** .1 determine the appropriate measures to ensure safe ship handling prior and during heavy weather in accordance with the established procedures. .2 explain the measures in assisting a ship or aircraft in distress and towing operations in accordance with the established procedures. .3 explain the safety measures in keeping an unmanageable ship out of trough of the sea, lessening drift and use of oil. .4 manage and handle the ship in heavy weather, including assisting a ship or aircraft in distress, towing operations, lessening drift and use of oil in accordance with established procedure.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5 A6.24
22.13 **Precautions in manoeuvring to launch rescue boats or survival craft in bad weather** .1 explain the precautionary measures in manoeuvring the ship to launch rescue boats or survival craft in bad weather condition. .2 explain the launching, manoeuvring and recovering of rescue boat and survival craft in bad weather condition in	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5

accordance with the established procedures.		
22.14 **Methods of taking on board survivors from rescue boats and survival craft** .1 explain the ship manoeuvring procedures and methods of taking survivors on board from rescue boats and survival craft in accordance with the established procedures.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5
22.15 **Manoeuvring and propulsion characteristics of common types of ships** .1 explain the manoeuvring and propulsion characteristics of common types of ships, with special references to: - stopping distances - turning circles at various draughts and speeds	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5
.2 perform the ship handling with respect to manoeuvring and propulsion characteristics of own ship in accordance with IMO manoeuvring standards as posted in the wheelhouse (manoeuvring poster), with special reference to: - stopping distances - turning circles at various draughts and speeds		A6.25
22.16 **Navigating at reduced speed** .1 explain the importance of navigating at reduced speed to avoid damage caused by own ship's bow wave and stern wave.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5

22.17 **Navigating in or near ice or in conditions of ice accumulation on board** .1 explain the practical measures to be taken when navigating in or near ice region and in condition of ice accumulation on board in accordance with the established procedures.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5
22.18 **Maneuvering in and near, traffic separation schemes and in vessel traffic service (VTS) areas** .1 explain the safe manoeuvres in and near, Traffic Separation Schemes (TSS) in accordance with Rule 10 of COLREGs, and Vessel Traffic Service (VTS) areas under the List of Radio Signals.	R1, R2, B1, B2, B4, B6, B7, B8, B9, B10, B11, B12, B16, B17, B21	A1, A2, A3, A4, A5
.2 perform the safe manoeuvres in and near, Traffic Separation Schemes (TSS) in accordance with Rule 10 of COLREGs, and Vessel Traffic Service (VTS) areas under the List of Radio Signals.		A6.26
Competence: Respond to navigational emergencies		
23. **Precautions when beaching a ship** .1 explain the safety precautionary measures when beaching a ship in accordance with the established procedures.	R1, R4, B1, B2, B8, B9, B12, B16, B17	A1, A2, A3, A4, A5
.2 evaluate the appropriate actions when beaching a ship in accordance with the established procedures in a given scenario.		A6.27
24. **Action to be taken if grounding is imminent, and after grounding** .1 analyze the given circumstances and actions to take when a ship's grounding is imminent.	R1, R4, B1, B2, B8, B9, B12, B16, B17	A1, A2, A3, A4, A5
.2 assess the extent of damage when a ship is grounded and decide appropriate		A6.28

measures to ensure safety and minimize the effects of damage of the ship and ensure safety of person on board in accordance with the contingency plan in a given scenario.		
25. **Refloating a grounded ship with and without assistance** .1 explain the appropriate actions in refloating a grounded ship with and without assistance. .2 explain the precautions to be considered regarding the safety of personnel, vessel, and the environment when refloating. .3 evaluate the appropriate actions/measures to prevent further damage to the ship, and subsequently refloat it using her own power (self-propelled) or with the assistance of tugboat in a given scenario.	R1, R4, B1, B2, B8, B9, B12, B16, B17	A1, A2, A3, A4, A5 A6.28
26. **Action to be taken if collision is imminent, after a collision or impairment of the watertight integrity of the hull by any cause** .1 analyze the close-quarter situation that could lead to an imminent collision. .2 explain the appropriate actions to mitigate damage that may be sustained during collision. .3 assess the extent of damage following a collision or impairment of the watertight integrity of the hull by any cause in accordance with the contingency plan. .4 apply the action to be taken if collision is imminent and after the collision or impairment of the watertight integrity of the hull and to mitigate risks to personnel, vessel stability and the marine environment in accordance with the contingency plan in a given scenario.	R1, R4, B1, B2, B8, B9, B12, B16, B17	A1, A2, A3, A4, A5 A6.29

27. **Assessment of damage control** .1 evaluate the effectiveness of damage control measures taken under worsening external conditions to safeguard the vessel's integrity, the well-being of all personnel, and the marine environment as outlined in the Damage Control Plan.	R1, R4, B1, B2, B8, B9, B12, B16, B17	A1, A2, A3, A4, A5
28. **Emergency steering** .1 explain the actions to be taken in the event of steering gear failure, including emergency steering procedures and effective communication, as prescribed in the established contingency plan.	R1, R4, B1, B2, B8, B9, B12, B16, B17	A1, A2, A3, A4, A5
29. **Emergency towing arrangements and towing procedure** .1 analyze the vessel’s response to the emergency towing arrangements (ETA) and towing procedures as specified in the ETA manual/booklet.	R1, R4, B1, B2, B8, B9, B12, B16, B17	A1, A2, A3, A4, A5
Competence: Operate remote controls of propulsion plant and engineering systems and services		
30. **Operating principles of marine power plants** .1 explain the operating principles of marine power plants in accordance with the operating manuals.	R1, R4, B1, B9, B18	A1, A3
31. **Ships’ auxiliary machinery** .1 explain the remote operations and importance of different ships’ auxiliary machineries relative to the propulsion plant in accordance with the operating manuals.	R1, R4, B1, B9, B18	A1, A3
32. **General knowledge of marine engineering terms** .1 explain the common marine engineering terms used on board relative to the	R1, R4, B1, B9, B18	A1, A3

	propulsion plant and engineering systems and services.		