

**ANNEX B OF CMO NO. 20, SERIES OF 2015
BACHELOR OF SCIENCE IN MARINE TRANSPORTATION
COURSE SPECIFICATIONS**

Course Code	:	Seam 5
Course Descriptive Title	:	Ship Handling and Maneuvering
Course Credits	:	2 units
Lecture Contact Hours per Week	:	1 hour
Laboratory Contact Hours per Week	:	3 hours
Prerequisite	:	D-Watch 1
Reference/s	:	1. Table A-II/1 of the 1978 STCW Code as amended Function: Navigation at the operational level 2. Annex A of CMO No. 20, Series of 2015 (Curriculum Mapping for BSMT)

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
Respond to Emergencies	Precautions for the protection and safety of passengers in emergency situations	Contingency Plans for Response to Emergencies - lists the contents of a muster list and emergency instructions - states that duties are assigned for the operation of remote controls such as: - main engine stop - ventilation stops - lubricating and fuel oil transfer pump stops - dump valves - CO2 discharge - watertight doors and operation of essential services such as: - emergency generator and switchboard	8

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - emergency fire and bilge pumps - describes the division of the crew into a command team, all emergency team, a back-up emergency team and an engine-room emergency team - explains the composition of emergency teams - states that crew members not assigned to emergency teams would prepare survival craft, render first aid, assemble passengers and generally assist the emergency parties as directed - states that the engine-room emergency team would take control of ER emergencies and keep the command team informed - states that good communications between the command team and the emergency teams are essential - describes the actions to take to deal with: <ul style="list-style-type: none"> - fire in specific areas such as galley, accommodation, engine- room or cargo space, including co-ordination with shore facilities in port, taking account of the ship's fire-control plan - rescue of victims in an enclosed space - heavy weather damage, with particular reference to hatches, ventilators and the security of deck cargo - rescue of survivors from another ship or the sea - leakages and spills of dangerous cargo - grounding - abandoning ship - explains the importance of drills and practices 	
	Precautions for the protection and safety of passengers	- states that some crew members will be assigned specific duties for the mustering and control of passengers for vessels not classified as passenger vessels which may require specific training as specified under Chapter V of the STCW	1

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<p>Code, lists the duties such as:</p> <ul style="list-style-type: none"> - warning the passengers - ensuring that all passengers spaces are evacuated - guiding passengers to muster stations - maintaining discipline in passageways, stairs and doorways - checking that passengers are suitably clothed and that life jackets are correctly donned - taking a roll-call of passengers - instructing passengers on the procedure for boarding survival craft or jumping into the sea - directing them to embarkation stations - instructing passengers during drills - ensuring that a supply of blankets is taken to the survival craft 	
	Initial action following collision or grounding	<p>Precautions to be Taken When Beaching a Vessel</p> <ul style="list-style-type: none"> - describes the circumstances in which a vessel may be beached - states that a gently shelving beach of mud, sand or gravel should be chosen if possible - explains why beaching should be at slow speed - states that wind or tide along the shore will quickly swing the ship broadside on to the beach - describes measures which can be taken to prevent the ship driving further ashore and to assist with subsequent refloating 	1

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - states that all tanks and compartments should be sounded and an assessment made of damage to the ship - states that soundings should be taken to establish the depth of water round the ship and the nature of the bottom 	
		<p data-bbox="724 516 1129 542">Actions to be Taken on Grounding</p> <ul style="list-style-type: none"> - states that, on stranding, the engines should be stopped, watertight doors closed, the general alarm sounded and, if on a falling tide, the engines should be put full astern to see if the ship will immediately refloat - states that the engineers should be warned to change to high-level water intakes - states that a distress or urgency signal should be transmitted and survival craft prepared if necessary - states that all tanks and compartments should be sounded and the ship inspected for damage - states that soundings should be taken to establish the depth of water round the ship and the nature of the bottom - describes measures which can be taken to prevent further damage to the ship and to assist with subsequent refloating - explains how ballast or other weights may be moved, taken on or discharged to assist refloating - describes the use of ground tackle for hauling off - describes ways in which tugs may be used to assist in refloating 	1

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - describes the use of the main engine in attempting to refloat and the danger of building up silt from its use 	
		<p>Actions to be Taken Following a Collision</p> <ul style="list-style-type: none"> - states that after impact the engines should be stopped, all watertight doors closed, the general alarm sounded and the crew informed of the situation - states that in calm weather the colliding ship should generally remain embedded to allow the other ship time to assess the damage or prepare to abandon ship - states that survival craft should be made ready for abandoning ship or assisting the crew of the other ship - states that a distress or an urgency signal should be made, as appropriate - states that, if not in danger, own ship should stand by to render assistance to the other for as long as necessary - states that all details of the collision and subsequent actions should be entered in the log-book 	1
		<p style="text-align: center;">Initial Damage Assessment and Control</p> <ul style="list-style-type: none"> - states that damage to own ship should be determined - describes measures to attempt to limit damage to save own ship - states that continuous watch should be kept on the damaged area and temporary repairs - describes a steering arrangement using materials normally found aboard 	2

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - ship describes a means of constructing a rudder, where practicable 	
	<p>Appreciation for the procedures to be followed rescuing persons from the sea, assisting a ship in distress and port emergencies</p>	<p style="text-align: center;">Rescue of Persons from a Vessel in Distress or from a Wreck</p> <ul style="list-style-type: none"> - states that it is preferable to wait for daylight when no immediate danger exists - states that rescue boats or motor-lifeboats would be used if conditions permitted - states that unnecessary equipment should be removed from the boats and be replaced by life jackets, lifebuoys, immersion suits, blankets and a portable VHF radio - describes how both ships can spread oil in rough weather - describes the preparations for taking survivors on board from the boats - describes how to provide a lee and launch boats - describes how boats should approach the wreck and pick up survivors - describes the methods of recovery of boats and survivors - describes methods of rescue which may be used when sea conditions are too dangerous to use boats 	2
		<p style="text-align: center;">Actions which can be Taken When Emergencies Arise in Port</p> <ul style="list-style-type: none"> - describes actions to take in the event of fire on own ship, with 	1

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<p>particular reference to co-operation with shore facilities</p> <ul style="list-style-type: none"> - states that a duplicate set of fire control plans is stored for the assistance of shore-side fire-fighting personnel - describes actions to be taken when fire occurs on a nearby ship or adjacent port facility - lists situations in which a ship should put to sea for reasons of safety - describes the actions which can be taken to avoid a ship dragging anchor towards own ship in an anchorage 	
		<p style="text-align: center;">Measures for Assisting a Vessel in Distress</p> <ul style="list-style-type: none"> - states that both vessels should have everything prepared and have agreed on communications before the arrival of the towing ship - describes how to approach a disabled vessel and pass the first connection by line-throwing apparatus or other methods - states that the tow normally passes a messenger, followed by a wire messenger, to the towing vessel to haul across the towing wire - describes how to payout the towing wire under control - describes methods of securing the towing wire at the towing ship - explains why the wire is usually shackled to the anchor cable at the tow - describes the preparations made by the disabled ship 	1

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - states that the towing wire should be protected from chafing at fairleads - states that wires and cables should be inspected frequently and the nip freshened if any sign of wear or chafe is found - states that the towed vessel should be steered to reduce yawing - states that both ships should remain alert for signals from other vessel - describes how to disconnect the tow on arrival at the destination - describes the arrangements for emergency towing of tankers greater than 50,000 tonnes deadweight - lists the information to be transmitted to the towing ship 	
Maneuver the ship	Ship handling and maneuvering	<p>The Effects of Various Deadweights, Draughts, Trim, Speed and Under-Keel Clearance on Turning Circles and Stopping Distances</p> <ul style="list-style-type: none"> - outlines the provision and display of manoeuvring information recommended in Assembly resolution A.601(15) - defines the terms: <ul style="list-style-type: none"> - advance - transfer - drift angle - tactical diameter - track reach - head reach - side reach - compares the turning circles of a ship in the loaded and ballasted conditions 	4

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - compares turning circles for differing speeds - explains the use of the Rate of Turn Indicator to assist turning of vessel - describes the accelerating turn - states that the size of the turning circle increases as the under-keel clearance reduces - describes how speed reduces during a turn under steady engine power - compares the stopping distances of a ship in the loaded and ballasted conditions - explains why a loaded ship carries her way longer than when in ballast - states that the stopping distance for a loaded ship may be up to three times the stopping distance when in ballast - states that in shallow water a ship will carry her way longer than in deep water - defines 'directional stability' - describes the steering behaviour of directionally stable and unstable ships 	
		<p>Effect of Wind and Current on Ship Handling</p> <p>states that the effect of wind on a given ship depends upon:</p> <ul style="list-style-type: none"> -- the wind strength -- the relative direction of the wind -- the above-water area and profile -- the draught and trim -- the ship's fore-and-aft movement 	2

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - describes the behaviour of a ship moving ahead with a wind from various directions - states that, as a ship is slowed, a speed is reached at which the wind prevents maintaining course - describes the effect of wind when making large turns <ul style="list-style-type: none"> - describes the effect of wind on a ship making sternway - describes the effect of current on the motion of a ship - states that in rivers and narrow channels the current is usually stronger in the centre of a straight channel or at the outside of bends - describes how to make use of different current strengths when turning in a channel - describes how a current may be used to control lateral movement towards or away from a river berth - explains how to use an anchor to dredge down with a current - demonstrates the ability to manoeuvre the vessel in simple turning and anchoring manoeuvres in various conditions 	
		<p>Manoeuvres for the Rescue of a Person Overboard</p> <ul style="list-style-type: none"> - distinguishes between "immediate action", "delayed action" and 	2

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
-		<p>"person missing" situations</p> <ul style="list-style-type: none"> - describes the single turn, Williamson turn and Scharnow turn manoeuvres - explains the situations in which each turn is appropriate - states that the standard manoeuvres are not guaranteed to return a ship into its wake because of the effects of particular ship characteristics and environmental conditions on the ship and the person in the water - lists the sequence of actions to take when a person is seen to fall overboard - lists the actions to take when a man-overboard report is received on the bridge - demonstrates the ability to manoeuvre the vessel for the rescue of a person overboard 	
=		<p style="text-align: center;">Squat, and Shallow-Water and Similar Effects</p> <ul style="list-style-type: none"> - states that shallow water as a depth of less than 2 x ship's draught - states that shallow-water effects become more marked as depth decreases - states that shallow-water effects as: 	3

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
-		<ul style="list-style-type: none"> -- increased directional stability -- a large increase in turning radius -- the ship carrying her way longer and responding slowly to changes in engine speed -- speed falling less during turns -- squat increasing -- trim changing, usually by the head for a full hull form - states that 'squat' is defined as the reduction of under-keel clearance resulting from bodily sinkage and change of trim which occurs when a ship moves through the water - states that squat is considerably reduced by a reduction of speed - states that 'blockage factor' as the ratio of the cross-sectional area of the ship to the cross-sectional area of water in a channel - states that squat and other shallow-water effects increase as the blockage factor increases - states that excessive speed in shallow-water can ground a ship in water of sufficient depth to float it at slow speed - states that approaching shoal patches or banks may give rise to an unexpected sheer 	

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - states that reduced speed should be used in shallow water and narrow channels to reduce shallow-water effects and allow time to correct an unwanted sheer - states that increased vibration may be experienced in shallow water 	
		<p style="text-align: center;">Proper Procedures for Anchoring and Mooring</p> <ul style="list-style-type: none"> - describes how anchors should be cleared away ready for use - describes how the approach to an anchorage is made with regard to current and wind - states that anchors should be walked back clear of the hawse pipes when approaching the anchorage - describes the use of anchor buoys - describes the safety measures to be taken by the anchor party - describes the method of letting go and the amount of cable to veer initially - describes the marking of the cable and the reports to be made to the bridge - explains how to determine when the ship is brought up - states that the lights or shape for a vessel at anchor should 	4

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<p>be displayed as soon as the ship is brought up</p> <ul style="list-style-type: none"> - describes the procedures for anchoring in water too deep to let the anchor go on the brake - describes the securing of anchors on the completion of anchoring - describes the preparation for and procedure during heaving up <p>(Note: The following knowledge is not required under Part A, Chapter II, Table A-II/1 of the STCW Code. This knowledge more directly relates to the seamanship in line-handling, mooring and anchoring and may also be included in the instruction for Able Seafarer. It is recommended that the trainee has basic knowledge of the following)</p> <ul style="list-style-type: none"> - explains how to handle cable safely in a non-self-stowing locker - explains how to secure anchors and seal spurling pipes for a sea passage - lists the preparations to be made for berthing alongside - describes the use of head ropes, stern ropes, breast ropes and springs - describes the safety measures to be taken when handling 	

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<p>mooring ropes and wires</p> <ul style="list-style-type: none"> - describes how to join two mooring ropes together - describes typical mooring arrangements - demonstrates how to put a stopper on a rope or wire rope - demonstrates how to make a mooring rope or wire fast to bitts - describes the use of self-tensioning winches - states the importance of keeping mooring lines clear of the propeller and notifying the bridge when the propeller is not clear - describes how to make fast tugs on towing hawsers or lashed up alongside - describes the use of fenders during berthing and when secured in position - describes methods of mooring to a buoy - explains how to use a messenger to pass a wire or chain to a buoy - explains how to set up and secure a ship wire 	

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS	APPROX HOURS
		<ul style="list-style-type: none"> - describes the method of securing ropes and wires to a buoy - describes the procedures for singling up and letting go from berths and buoys - explains how to slip a slip wire - describes how to stow mooring ropes and wires for a sea passage - explains how to rig and light the pilot ladder - states what equipment should be at hand ready for use at the pilot ladder - states that the rigging of the ladder and the embarkation and disembarkation of the pilot should be supervised by a responsible officer 	
TOTAL			33