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

Course Code	**:**	Nav 3
Course Descriptive Title	**:**	Terrestrial and Coastal Navigation 2
Course Credits	**:**	5 units
Lecture Contact Hours per Week	**:**	3 hours
Laboratory Contact Hours per Week	**:**	6 hours
Prerequisite/s	**:**	Nav 2 and Math 2
Reference/s	**:**	1. Table A-II/1 of the 1978 STCW Code as amended Function: Navigation at the operational level 2. IMO Model Course 7.03 3. Annex A of CMO No. 20, Series of 2015 (Curriculum Mapping for BSMT)

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS/ PERFORMANCE	APPROX HOURS
Plan and conduct a passage and determine position	*Terrestrial and Coastal Navigation* Thorough knowledge of and ability to use nautical charts, and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ships' routeing information	1. Position Lines and Positions – Defines a position – Gives the radar distance off a charted object and plots its position circle on a chart – Plots a position on the chart from simultaneous cross bearings and from bearing and distance off – Explains the methods used to obtain simultaneous cross bearings with least error	15

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS/ PERFORMANCE	APPROX HOURS
		– Defines 'dead reckoning position (DR)', 'estimated position (EP)' and 'fixed position' – Plots a dead reckoning position on the chart and marks accordingly – Plots an estimated position on the chart and marks accordingly – Plots position lines - straight line, circle, hyperbola – Finds a position line by bearing, horizontal angle, vertical sextant angle, and transit line and radio aids – Determines a position by a combination of bearing, distance and the methods in the above objective – Finds a position by simultaneous bearings of two objects – Finds the distance that the ship will pass off a given point when abeam – Constructs a position line to clear a navigational danger by a given distance	
		2. Sailings – Defines 'departure' and states the relationship to difference of longitude – Defines 'true course' and 'rhumb line' – Derives the plane sailing formulae – Explains the relationship between departure and difference of longitude in cases involving a change of latitude, by using mean latitude – Uses the parallel sailing formula: Cosine of Latitude = Departure/ Diff of Longitude	34

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS/ PERFORMANCE	APPROX HOURS
		– Calculates the distance between two positions on the same parallel of latitude – Calculates the difference of longitude for a given distance run along a parallel of latitude – Derives the final position after sailing along a parallel of latitude – Demonstrates the uses of the plane sailing formulae – Understands the meaning of, and can derive, mean latitude – Calculates the correct departure to use in a plane sailing problem – Calculates the course and distance between two positions, using the plane sailing formula – Calculates a DR position or an estimated position by using the plane sailing formula, given compass course and compass error, distance by log, estimated speed, tidal and current information and leeway – Describes the layout of a traverse table – Derives the information required in a parallel or plane sailing problem, using a traverse table or calculator – Solves problems of plane sailing, using a calculator – Solves problems of DR and fixing positions, using plotting charts – States the Mercator sailing formula – Uses the Mercator formula to calculate course and distance between two positions – Uses the Mercator formula to calculate the final	

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS/ PERFORMANCE	APPROX HOURS
		position, given the initial position, course and distance – Demonstrates understanding of great circle sailing including composite and limited latitude great circles – Calculates initial course and distance of a great-circle track – Calculates composite great circles – Demonstrates the use of gnomonic charts for plotting the great circle between two points – Transfers a great circle from a gnomonic to a to a Mercator chart	
		3. Chartwork Exercises – Calculates the speed between two positions – Defines 'set', 'rate', 'drift' and 'leeway' due to wind – Defines describes 'ship's speed', 'effective speed', 'course and ‘distance made good', 'applied leeway' – Finds the course and distance made good with a tidal stream or current – Finds the course to steer, allowing for tidal stream or current – Finds the set and rate of tidal stream or current from charts or tables – Explains the term 'running fix' and uses the method to plot a position – Finds positions by running fix in a tidal stream or current – Calculates the actual set and rate of tidal stream or current from DR and fixed positions	70

COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	TOPICS/ PERFORMANCE	APPROX HOURS
		4. Tides – Explains the basic theory of tides – Defines 'spring tides', 'neap tides', 'height of tide' 'high water' and 'low water', 'mean high water springs', 'mean high water neaps', 'mean low water springs', 'mean low water neaps', 'range', 'chart datum' “highest astronomical tide” – Calculates the spring and neap ranges for standard and secondary ports – Finds the predicted time and height of high and low water at standard and secondary ports – Finds the time of a desired height of tide	18
		5. Keeping a Log – Describes the rules, regulations and common practice regarding keeping a log of a navigational log and voyage records – Describes the proper keeping of different kinds of log during ocean passages, coastal navigation and in port in line with the requirement in the company’s ISM Safety Management System	3
		TOTAL	140