सत्यमेव जयते
भारत सरकार / GOVERNMENT OF INDIA
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
MINISTRY OF PORTS, SHIPPING AND WATERWAYS
नौवहन महानिदेशालय, मुंबई
DIRECTORATE GENERAL OF SHIPPING, MUMBAI

DGS CIRCULAR 26 OF 2026

File No.:25-13011/24/2025-NT - DGS Comp. No- 38034	Date: 19.05.2026
Authorised By: Chief Examiner of Master and Mates	**Subject:** Introduction of six-month competency course for Deck Ratings to appear in the Second Mate (Foreign Going) Certificate of Competency Examination – reg.
Issued By: - EAC Branch, Nautical Wing	**NT EXAM CIRCULAR 02 of 2026**

1. Training, examination and certification of seafarers constitute a core responsibility of the Directorate General of Shipping (DGS), being the Maritime Administration of India. The Directorate remains committed to maintaining high standards of professional competence while facilitating structured career progression pathways for Indian seafarers in accordance with national regulations and India's obligations under the STCW Convention.

2. Whereas, it has been observed that a number of Indian Deck Ratings, after acquiring the requisite sea-going service on foreign-going ships, are proceeding abroad to pursue competency courses and certification pathways for progression to officer ranks, resulting in substantial expenditure.

3. Whereas, Rule 20(2)(b) of the Merchant Shipping (STCW) Rules, 2014 prescribes not less than 36 months of approved sea-going service as the minimum requirement for appearing for the Second Mate (Foreign Going) Certificate of Competency examination. Further, Para 5.5 of Section II/1 of Chapter II of TEAP Manual-A provides that candidates possessing the requisite sea service are required to undergo the NWKO (NCV) course and examination, or such other approved course, for eligibility towards the Second Mate (FG) Certificate of Competency.

9वीं मंज़िल, बीटा बिल्डिंग, आई थिंक टेक्नो कैम्पस, कांजुर गाँव रोड, कांजुरमार्ग (पूर्व) मुंबई- 400042
9th Floor, BETA Building, I-Think Techno Campus, Kanjur Village Road, Kanjurmarg (E), Mumbai-400042
फ़ोन/Tel No.: +91-22-2575 2040/1/2/3 फ़ैक्स/Fax.: +91-22-2575 2029/35 ई-मेल/Email: dgship-dgs@nic.in वेबसाइट/Website: www.dgshipping.gov.in

4. In order to facilitate structured career progression for eligible Deck Ratings and Deck Cadets and to provide an additional competency-based certification pathway, the Directorate General of Shipping has introduced a Six-Month Competency Course for Deck Ratings leading to Second Mate (FG) Certificate of Competency, as an additional pathway to the existing NWKO (NCV) route.

5. This scheme provides career progression for Deck rating and Deck Cadets, who have completed approved pre-sea training, and have at least 36 months of approved sea service on foreign-going ships. Such candidates would become eligible to undertake this six-month competency course, as a step towards obtaining Second Mate (FG) Certificate of Competency, subject to compliance with all applicable requirements.

6. The said course is aligned with **IMO Model Course 7.03 (Officer in Charge of a Navigational Watch)** and the competency requirements specified under **STCW Code Table A-II/1**. The detailed syllabus is enclosed as **Annexure-II**.

7. The course shall **commence from July 2026**. The eligibility criteria and training pathway shall be as prescribed in **Annexure-I**.

8. Candidates, upon successful completion of the prescribed course and fulfilment of all other applicable requirements, shall be permitted to appear for the **Second Mate (Foreign Going) Certificate of Competency Examination**.

9. The details of the course are as under:

Name of the Course	**Sea Going Service Required**	**Applicability**	**Course syllabus Details**
Six-Month Competency Course for Deck Ratings leading to Second Mate (FG) CoC	Minimum 36 months of approved sea-going service on foreign-going ships, including not less than 6 months of supervised bridge watchkeeping duties duly recorded in an approved TRB	Deck Ratings / Deck Cadets with approved Pre-Sea Training meeting requirements as per Annexure-I	As per Annexure-II

10. In view of the above, the relevant provisions of **Chapter II, Section II/1 of TEAP Manual-A** shall be deemed amended to the extent covered under this Circular.

11. Maritime Training Institutes (MTIs) conducting Second Mate (FG) Competency Courses may apply to the Directorate General of Shipping for obtaining approval to conduct the aforesaid course.

This is issued with the approval of the Chief Examiner of Masters and Mates.

Capt. Ravi Singh Sikarwar

Nautical Surveyor-cum- DDG (Tech.)

To,

1. DGS Secretariat.
2. Nautical Advisor to the Govt. of India
3. All Maritime Training Institutes
4. INSA/FOSMA/MASSA/ICCSA/CMMI.

Copy to:

1. All Mercantile Marine Department.(Kolkata/Chennai/Mumbai/Kandla/Kochi)

ANNEXURE-I

Flow Diagram II/1-1 (B) – For Deck Rating/Cadet with Foreign Going Sea Service

STREAM FLOW	**Deck Ratings/ Deck Cadets**
ENTRY CRITERIA	
Educational Qualification	12th Standard HSC any stream OR Any Graduation Degree or Any Diploma OR SSC 10th + ITI Trade Course Certificates
Age (years)	18 years or above
Pre-Sea Training	Approved GP Rating Course or Deck Cadet Course
Medical Fitness	As per prescribed medical standards
BASIC SAFETY TRAINING (STCW)	STCW Code A-II/1 (in part): a. A-VI/1-1: PST b. A-VI/1-2: FP & FF c. A-VI/1-3: EFA d. A-VI/1-4: PS & SR e. A-VI/6-2: STSDSD
SEA-GOING SERVICE	a. Minimum 36 months approved sea-going service on **foreign going ships.** b. Including not less than 6 months of supervised bridge watchkeeping duties, duly recorded in an approved Training Record Book (TRB). *Note: Candidates can use any of the approved TAR book available for deck cadets and complete the section on Bridge watchkeeping.*
POST-SEA EDUCATION AND TRAINING	a. Assessment of sea-going service b. A-II/1: Approved Foundation Course (PCME) – 2 months *(may be undertaken after 18 months sea service)* c. Six-Month Competency Course for Second Mate (FG) d. Radar Observer Simulator Course e. ARPA Course f. ECDIS Course g. A-IV/2: GMDSS GOC h. A-VI/2-1: PSC & RB i. A-VI/3: AFF j. A-VI/4-1: MFA k. A-VI/6-2: STSDSD *(if not done earlier)* l. A-VI/5: SSO *(optional)*
EXAMINATION AND ASSESSMENT	Written and Oral Examinations
Certificate Of Competency Obtained	Officer in Charge of a Navigational Watch (Second Mate of a Foreign Going Ship)

ANNEXURE-II

The following syllabus is structured in accordance with the competencies specified under STCW Code Table A-II/1 and is aligned with IMO Model Course 7.03 (Officer in Charge of a Navigational Watch).

SECOND MATE (FOREIGN GOING)

1. *TERRESTRIAL AND COASTAL NAVIGATION*

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Competence No. 1: Plan and conduct a passage and determine position			
1.1 Terrestrial and Coastal Navigation			
1.1.1 *Define:* *Shape of earth,* *Great circle, small circle* *Spherical Triangle* *Earth's axis,* *Poles,* *Equator,* *Latitude, parallels of latitude,* *Meridians, prime meridian, longitude,* *Difference of latitude and longitude,* *Geographic mile, statute mile, nautical mile, compare with kilometre, cable and knots.*	*3*		
1.1.2 Charts *Explain:* *Natural scale* *Chart datum* *Meridional parts* *Gnomonic charts* *Plan charts* *Mercator charts* *Chart catalogue, Chart folio and Chart Correction log* *Procedures for correction of charts and Nautical publications including T&P notices using information from Notices to Mariners and corrections using tracings.* *Exercises on chart correction*	*4*	*8*	
1.1.3 Datums *1.1.4 Compass Corrections* *Explain :* *Earths axis of rotation,* *Directions by gyro and magnetic compass* *Deviation, Variation, Compass error (Gyro and Magnetic)* *How to determine error by Transit bearings*	*3*	*2*	

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
1.1.5 Distances *Explain:* *How to determine distance between two positions on a Mercator chart.*	*2*		
1.1.6 Position lines and positions *Define :* *Position line, position circle.* *Explain:* *How to determine the position of ship by range and bearing, Horizontal sextant angles, simultaneous bearings of 2 or more objects.* *Dead reckoning, Estimated position* *Beam distance*	*3*	*5*	
1.1.7 Plane and Mercator Sailings *Explain :* *Departure, relationship with D'long, D'lat, Distance* *True course and rhumb line.* *Parallel sailing formula* *Plane sailing formula* *Use of traverse table,* *Mercator sailing* *Day's work* *Exercises based on all of the above and calculation of slip.*	*3*	*9*	
1.1.8 Chart work exercises *Define:* *Current, leeway, tidal stream, set, drift.* *Explain:* *Effect of wind and current and determine course and distance made good.* *Course to steer allowing for tidal stream or current or wind.* *Exercises:* *Determine position circle by horizontal sextant angle.* *Determine position by three bearings.* *Simple geometric applications: Doubling of bow angle, 4 point bearing.* *Determine position by plotting astronomical PL.* *Transferring of position circle.* *Determine position by running fix with leeway and current. (No questions on fish triangle)*	*4*	*12*	
1.1.9 Information from Nautical charts, lists of lights and other publications	*4*	*5*	

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Interpret : *Contours, topography, depths, nature of bottom* *Traffic lanes, zones* *Information from navigation chart* *Last correction.* *Information from publication 5011* *Information from Tide tables* *Explain:* *IALA system of buoyage,* *Geographical range, luminous range, nominal range, raising and dipping distances.* *How to determine first/last sighting distances,*			
1.1.10 Tides *Explain :* *Range, duration of tide, height of tide, spring and neap tides, standard and secondary port.* *Determination of heights for intermediate times & vice-versa for standard and secondary ports.* *Use of tidal stream atlas.* *Procedure to determine tidal stream direction and rate from approach charts.*	3	7	
1.1.11 Keeping a log *Describe:* *Procedures for keeping log during ocean passages, coastal navigation and at anchor.*	3		
1.1.12 Passage Planning: Plan a passage using the procedures for passage planning. *Plan a passage between two ports from berth to berth using the procedures for passage planning.* ➢ *Appraisal – ascertain the charts and publication required for the voyage and whether they are corrected and up-to-date, Extract all relevant information from the publications and obtain weather prognosis.* ➢ *Planning – Plot courses on the charts, both small and large scale, way points, no-go areas, contingency anchorages, alerts, abort points and other relevant marks. Prepare a Passage Plan document.* ➢ *Execution – During the voyage, fix positions as indicated on the passage plan, maintain sufficient bridge manning levels, obtain Navigational and weather*	7	16	

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
warnings, maintain lookout and navigate to keep clear of other vessels and navigational hazards. ➢ *Monitoring – Monitor frequently the traffic, position, weather, visibility and maintain a situational awareness at all times. Check the proper functioning of navigational instruments and fill up logs periodically during watch.* *Exercises on passage planning including Constant radius turn.*			
1.1.13 Great Circle sailing & Polar Navigation : *Define:* *Great circle, Small circle, Vertex.* *Explain:* *Calculation of initial course, final course, great circle distance, vertex and intermediate position.* *Use of gnomonic chart to plot a great circle track and transfer it to a Mercator chart.* *Polar Naigation.*	4	5	
TOTAL	43	69	

TCN TOTAL: 112 HRS

2. *CELESTIAL NAVIGATION*

TOPICS	**Teaching method/hours**		
	Lectures	*Exercise*	*Practicals*
Competence No. 1: Plan and conduct a passage and determine position ***1.2 Celestial Navigation:***			
1.2.1 Solar system : *Define* - *Perihelion and aphelion,* - *Solstices and equinoxes* *Explain :* - *Kepler's laws of planetary motion,* - *Twilights, daylight and darkness conditions.* *Identify* - *Planets useful for Navigation* *Earth-moon system:* *Define* - *Apogee, perigee, conjunction, opposition,* *Explain:* - *Solar and lunar eclipses.* - *Phases of Moon* *Calculate* - *Twilight timings for celestial observations (morning/ evening)* *(No questions to be asked on Precession of Equinox)*	3	2	
1.2.2 Celestial sphere and equinoctial system of co-ordinates : *Define:* - *Celestial sphere,* - *Celestial poles,* - *Celestial meridians,* - *Equinoctial,* - *Obliquity of ecliptic,* - *Declination* - *First point of Aries*	2		
1.2.3 Hour angle *Explain :* - *GHA, LHA, RA, SHA* - *Rate of change – Sun and Aries* - *'v' corrections* (excluding retrograde motion of Venus), *'d' correction* - *GP of the body.*	3		
1.2.4 Daily motion and horizontal system of co-ordinates : *Explain* - *Rational horizon,* - *Zenith, Nadir,* - *Vertical circle, Prime vertical*	2		

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
- *Elevated pole,* - *Depressed pole,* - *True altitude,* - *True zenith distance,* - *Polar distance* - *Azimuth* - *PZX triangle,* - *Circumpolar bodies, Upper and Lower transits* *Draw figures on the plane of rational horizon*			
1.2.5 Sextant and altitude corrections : *Explain* - *Reading a sextant, Errors of Sextant* - *Index error, how to determine* - *Visible, Sensible, and rational horizons,* - *Observed altitude,* - *Dip,* - *Apparent altitude* - *Refraction,* - *Semi-diameter and parallax,* - *Use of Altitude correction tables.* - *True altitude* - *True Zenith distance*	3		
1.2.6 Amplitude : *Define: Amplitude* *Explain* - *Theoretical and visible sunrise and sun set,* *Calculation of true amplitude by formula and nautical tables.*	2	2	
1.2.7 Time : *Define :* *Equation of time (no numericals).* *Explain* - *relationship between LHA (sun) and LAT,* - *mean solar day* - *GMT, LMT and longitude relationship,* - *Zone and standard times,* *International Date Line and its use.*	1		
1.2.8 Nautical Almanac *Explain* - *Information in Nautical Almanac and using it for celestial observations.* - *Use of tables of corrections, incremental corrections.* - *How to determine LHA of body, given GMT date and time, Longitude of observer.* - *How to determine LHA of Aries given GMT date and time* - *How to determine LHA Star given GMT date and time*	1	3	

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
1.2.9 Latitude by meridian altitude of Sun *Explain* - *Relationship between altitude of pole and latitude* *Calculation of latitude by meridian altitude*	1	3	
1.2.10 Pole Star observations *Explain* - *How to identify Pole Star* - *Use of a_0, a_1, a_2 corrections* *Calculation of azimuth and position line, and position through which PL passes.*	1	2	
1.2.11 Position fixing (Sun, Moon, Planets and Stars) *Explain determination of PL by* - *Ex-Meridian of Sun* - *Longitude by chronometer* - *Intercept method* - *True azimuth of a body,* - *Position by two simultaneous or staggered observations.* (No calculations shall be based on ambiguity of time or date, incorrect application of chronometer error, index error or dip, etc.)	3	9	
1.2.12 Errors of compasses – Azimuths and Amplitudes *Explain* - *Determination of compass error by Celestial observations. (Including the use of ABC Tables)*	1	2	
TOTAL	23	23	

TOTAL CELESTIAL NAVIGATION = 46 HRS

3. *METEOROLOGY*

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Competence No. 1: Plan and conduct a passage and determine position ***1.4 Meteorology***			
1.4.1 Ship borne meteorological instruments *Explain:* *Principle, use, working, errors ,care and maintenance of following* *Aneroid barometer* *Barograph,* *Hygrometer,* *Stevenson's Screen,* *Whirling Psychrometer* *Anemometer*	*6*		
1.4.2 The atmosphere, its composition and physical properties *Explain:* *Troposphere, Tropopause, Stratosphere, Stratopause, Mesosphere, Mesopause, Thermosphere, Insolation, Water vapour, Evaporation, Condensation, Latent heat, Dew point, Absolute humidity, Relative humidity, and Vapour pressure*	*3*		
1.4.3 Atmospheric pressure : *Define:* *Pressure* *Explain:* *Change of pressure with height, Average pressure, Isobar, Isallobar* *Basic Units of pressure* *Barometric tendency*	*3*		
1.4.4 Wind : *Define:* *Wind* *Explain:* *Beaufort scale of wind force, Pressure gradient force, Coriolis force, Buys-Ballot's Law, Geostrophic wind, Gradient wind* *Use of geostrophic wind scale.*	*4*	*4*	

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Difference between True wind and apparent wind. *Pressure distribution and wind* *Information available from wind rose* *Exercises on determining True wind velocity by using vector diagram, given the apparent wind, ships course and speed.*			
1.4.5 Cloud and precipitation : *Explain:* *Formation of clouds by turbulence, Orographic lifting, convection, convergence and frontal lifting.* *Describe:* *Ten basic cloud types.* *Classification of clouds as per height* *Define:* *Rain, drizzle, hail, snow, sleet.*	*8*		
1.4.6 Visibility : *State:* *Visibility is reduced by presence of particles in the atmosphere* *Define:* *Fog, Mist and haze.* *Explain:* *Formation of fog, mist, haze* *Different types of fog, seasons and areas.* *Effect of fog, mist, haze and sea smoke.* *Describe:* *Methods of estimating visibility at sea, by day and by night.*	*4*		
1.4.7 Climatology: The wind and pressure systems over the oceans *Sketch and Explain:* *Mean surface pressure distribution* *Mean surface wind distribution* *Describe characteristics and location of:* *Doldrums,* *Inter-tropical convergence zones,* *Trade winds* *Westerlies,* *Polar easterlies,* *Monsoons,* *Explain with examples:* *Land and sea breeze,* *Anabatic and katabatic winds* *Local winds*	*5*		
1.4.8 Sea and swell: *Define:*	*1*		

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Sea waves, swell, storm surge *Tsunami and bore tides.*			
1.4.9 Weather Systems: *Define:* *Air mass, warm front, cold front, depression.* *Explain:* *Formation of air mass, source region* ***Structure of depressions,*** ***Warm front, cold front, occluded front*** ***Symbols of warm, cold and occlusion.*** *Define:* *Cyclone, Anticyclone, Col, Ridge, Trough* ***Describe:*** *Weather associated with Ridge, Col, Trough, Cyclone and Anticyclone, TRS (Basics and identification)* *Explain:* *How to identify depression, ridge, col, anticyclone on synoptic or prognostic chart.*	*4*		
1.4.10. Weather Reports and Forecasting : *Describe:* *Organisation, function and objectives of WMO* *Sources of weather information.* *Information flow between ships and meteorological offices.* *Various services provided by meteorological offices.* *Weather bulletins and contents of each section.* *Weather routeing services.* *Types of information received by facsimile receiver including storm warnings* *Digital weather receivers (Special softwares)* *Recording and reporting weather :* *Explain:* *Need for meteorological Codes.* *Use of Code and De-code book* *Procedure for Coding/ Decoding of weather messages.* *Weather forecasting:*	*5*	*3*	

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Interpret: *Symbols and Isobaric patterns on weather charts and facsimile charts.* *Weather associated with the synoptic features.* *Explain:* *Basic concepts of weather routeing.* *Use of climatological information from routeing charts.* *How meteorological forecasts, synoptic and prognostic charts are used to modify route plan.* *Advantages of shore based routeing.*			
TOTAL	*43*	*7*	

TOTAL METEOROLOGY = 50 HRS

4. *BRIDGE EQUIPMENT*

TOPICS	Teaching method/hours		
	Lectures	**Exercise**	**Practical**
Competence No. 1: Plan and conduct a passage and determine position ***1.3 Electronic Systems of Position Fixing***			
1.3.1 Terrestrial Navigation systems: *Explain principle* *Draw block diagram* *Describe the working* *Enumerate and describe various errors of new terrestrial electronic position fixing systems.*	4		
1.3.2 Global Positioning System ***(GPS)*** *Explain:* *Working principle* *System configuration and frequencies used* *C/A and P codes* *How Position is determined* *Contents of Navigation message* *Various DOP's used* *Errors and alarms of GPS (Emphasize on accuracy of GPS fix in confined waters)* *Accuracy obtainable with GPS and how accuracy can be downgraded.* *WGS 84 datum- why GPS position cannot be directly plotted on the navigation chart* *Datum shifts* *Working principle of DGPS and its limitations*	5		
1.3.3 Electronic Charts Display and Information System ***(ECDIS):*** *Compare:* *ECDIS and paper charts* *Raster and Vector charts* *ECS and ECDIS.*	2		
1.3.4.Automatic Identification System ***(AIS):*** *Explain:* *Purpose of AIS* *The Principle* *Frequencies used* *Types of messages and time interval* *Information displayed on AIS screen* *Limitations of AIS* *Precautions during use of AIS for collision avoidance.* *SSRM (Short Safety Related Message)*	3		
1.3.5. Long Range Identification and Tracking ***(LRIT):*** *Explain:* *Purpose of LRIT* *Data transmitted by LRIT* *Authorised receivers of data* *Difference between LRIT* and AIS	1		

TOPICS	Teaching method/hours		
	Lectures	**Exercise**	**Practical**
1.3.6 Voyage Data Recorder and Simplified Voyage Data Recorder ***(VDR & S-VDR)*** *Explain:* *Purpose of VDR* *Data recorded on VDR* *Duration of data stored* *Modules of VDR* *Data recorded on S-VDR.* *Saving and retrieval of data in case if incident and training purpose* *State* *S-VDR should be "float free".*	1		
Echo-Sounders and Speed measurement			
1.3.7 Echo sounders: *Draw a block diagram* *Explain:* *Echo sounder as a valuable navigational aid.* *Basic principle,* *Effect of density, temperature and pressure on velocity of sound and the limits in which the true value may lie.* *Ranging and Phasing* *Danger of wrong phasing* *Inaccuracies of equipment, scale error and measures to eliminate them. False echoes* *Errors due to Trim, List & positioning* *Various alarms and settings.* *Briefly describe Operation and user maintenance such as clean platen, change paper, change and adjust stylus.*	*3*		
1.3.8 Speed log: *Differentiate between ground reference speed and water reference speed.* *Electro magnetic log:* *Explain:* *Principle* *The Errors* *Doppler speed log:* *Explain:* *Principle* *The Limitations* *Janus configuration* *Dual axis configuration and its uses during docking operations.* *Calibration of the log* *List* *The main error sources of Doppler log.* *Describe*	4		

TOPICS	Teaching method/hours		
	Lectures	**Exercise**	**Practical**
How ship's speed is transmitted to remote displays (block diagram). *Draw* *A Sketch showing how indication of distance run is derived from a speed log.*			
Compass – Magnetic and gyro:			
1.3.9 The magnetism of the earth *Explain:* *Earth as magnet, Magnetic poles, Variation and annual change*	*1*		
1.3.10 The magnetic compass *Knowledge of the principles of magnetic compass* *Describe:* *Construction of Magnetic compass card: Liquid and Dry* *Explain:* *Lubber line, its purpose* *Deviation & Effect of heading* *Need for regular checking of error* *Transmitting Heading Device* *Describe:* *Procedure to determine Compass error* *Sketch:* *Section through compass to show pivot support*	*4*	*1*	*1*
1.3.11 Gyro-compass *Knowledge of the principles of gyro compass* *Explain:* *Free gyroscope,* *Gyroscopic inertia* *Precession of the axis* *Rate of precession is proportional to the torque.* *Tilt & drift* *Rate of drift and tilt* *North seeking ability of gyro compass,* *Procedure to determine Gyro compass error* *How the repeater system is switched on and aligned with Master Gyro compass.* *Alarms and controls* *State* *Settling time of gyro compass* *Latitude and Steaming errors* *List* *The equipment getting heading inputs from gyro compass.* *Understand* *Starting of the gyrocompass and how to minimise the settling time by slewing and levelling it to the correct heading.*	*4*		

TOPICS	Teaching method/hours		
	Lectures	**Exercise**	**Practical**
1.3.12 Automatic pilot: *Explain:* *The principle* *Various settings of the auto-pilot for optimal performance* *The procedures for change over and factors to take into account for change over* *Adaptive automatic pilot systems and its functions* *Various alarms* *The need for regular checking and test of auto pilot* *The regulation regarding the use of auto pilot.* *States* *The automatic pilot should be included in the steering gear testing prior to ship's departure.*	4		
Steering control systems *1.3.13 Knowledge of steering control systems, operational procedures, and change over from manual to auto and vice-versa:* *Explain:* *Procedure for testing of steering system.* *Follow-up, Non follow-up* *Rate of Turn Indicator**(ROTI):*** *Describe:* *Procedure to execute a constant radius turns.* *Explain:* *The need to monitor the turn.*	6		
TOTAL	***42***	***1***	**1**

TOTAL BRIDGE EQUIPMENT = 44 HRS

5. *BRIDGE WATCHKEEPING & EMERGENCIES*

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Competence No. 2: Maintain a safe navigational watch ***Watch-keeping***			
2.1.1 Describe: *Watch-keeping Arrangements* - *in accordance with the situations* - *any limitation in qualifications or fitness of individuals* - *individual roles, responsibility and team roles shall be established* - *effective use of the resources available, such as information, installations/equipment and other personnel;* - *understand functions, operation and handling of installations/equipment* - *Sharing of information from equipments* - *Need for appropriate communication* - *Bridge manning levels*	4		
2.1.2 Collision Regulations: *Explain:* *Define:* *General definitions which apply to COLREGS as set in Rule 3.* *Vessel underway* *Vessel making way* *Explain:* *A proper lookout* *Full appraisal of situation and risk of collision* *Factors to take into account in determining safe speed* *Compare rule 6 and rule 19* *Dangers of making assumptions on scanty information* *Actions to avoid collision in different situations* *Monitoring the situation till past and clear* *The content, application and intent of COLREG 72 rules 1 to 38*	16	8	
2.1.3 Keeping a safe navigational watch as per Section A-VIII/2 and B-VIII/2 of STCW: *Describe:* *Principles to be observed in keeping safe Navigational watch* *Navigational equipment* *Navigational duties and responsibilities* *Procedure for handing over and taking over watches* *Navigation with pilot embarked* *Navigation in coastal waters* *Action on receiving storm warning,*	18		

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Entries in logbook. *Procedures for embarkation/ disembarkation of Pilot* *Explain* *Circumstances in which the OOW should call Master, extra lookouts.* *Explain:* *Need for periodic checks of navigational equipment* *Bridge Navigation Watch Alarm System* *Ship Security Alert System* *Contents of Bridge Procedures Guide* *Hours of work and rest*			
2.1.4 Keeping an effective anchor watch: *Describe:* *Procedures for handing over taking over watches.* *Actions on receiving storm warning,* *Explain:* *Entries to be made in deck logbook.*	3		
2.2 Effective bridge team work procedures: *Explain:* *Effective bridge team work procedures* *Principles of team work* *Proper lookout* *Frequency and extent of monitoring of traffic* *Maintain record of movement and activities related to safe navigation* *Effective communications* *Situational awareness*	6		
2.3 The use of routeing in accordance with the General Provisions of Ship's Routeing including weather routeing	4		
2.5 The use of reporting in accordance with general principles for ship reporting systems and with VTS reporting procedures.	5		
2.6 Describe *Navigational Techniques used for safe navigation in restricted visibility (blind navigation / blind pilotage techniques).* *Explain* . *Parallel Index Techniques using Radar* *Provision for using Video Mapping on Radar/ ARPA* *Use of Depth Contours*	3		
2.7 Bridge resource management principles: *Explain:*	7		

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Allocation, assignment, and prioritization of resources *Effective communication* *Assertiveness and leadership* *Maintaining situational awareness*			

5.1 Contingency plans for response to emergencies: *List* *Contents of muster list,* *State:* *Duties are assigned for operation of remote controls:-* *M.E. Stop* *Ventilation* *Lubrication and fuel oil transfer pumps* *CO_2 discharge* *W/T doors* *Describe* *Importance of good communication between command team and emergency teams.* *Explain* *Safety, Urgency and Distress signals and when to transmit.* *Actions to take to deal with:-* • *Rescue of victims from enclosed spaces* • *Heavy weather damage* • *Rescue of survivors from another ship* • *Leakages and spills of dangerous cargo.* *Explain:* *Operation and use of :-* *EPIRB, SART, EEBD, TPA, Immersion suits, LTA, Breeches buoy.*	*6*		
5.2.1 Stranding *Describe* *Actions to be taken after stranding* • *Stop Engines* • *Inform Master and E/R* • *Sound General Alarm* • *Lights and shapes* • *Warning ships in the vicinity* • *Assessing Initial damage* • *Sounding of compartments* • *Control of W/ T doors* • *Sounding depths all round the ship using hand-lead* • *Measures to prevent pollution as per SOPEP* • *Assist Master*	*3*		

5.2.2 Contingency planning (Collision): *Describe:* *Command team, emergency team, back-up team, Engine room team.* *Actions to be taken after collision:-* • *Stop Engines* • *Inform Master and E/R* • *Sound General Alarm* • *Lights and shapes* • *Warning ships in the vicinity* • *Assessing Initial damage* • *Sounding of compartments* • *Control of W/ T doors* • *Measures to prevent pollution as per SOPEP* • *Prepare Survival crafts* • *Stand-by for assisting other vessel* • *Assist Master*	*3*		
5.2.3 Protection and safety of passengers: *Explain Procedures for:* *Warning the passengers,* *Mustering and Roll call.* *Evacuating all passengers,* *Instructing/Training passengers during drills*	*2*		
5.2.4 Limiting damage following a fire or explosion: *Explain :* *Actions on detecting fire(Galley, Accommodation, E.R., Cargo spaces)* • *Alarms* • *Muster and Roll call* • *Control of ventilation* • *Fire fighting equipment* • *Fixed fire detection and extinguishing systems* • *Boundary cooling* • *Man entry* • *First aid* • *Assessment of damage and control measures* *Explain:* *Fire Control plan and its location* *Importance of drills and practice.*	*3*		
5.2.5 Procedure for abandoning ship: *State:* • *Verbal order by Master for abandoning ship.* *Actions:* • *Muster and Roll call* • *Extra blanket, warm clothing, Immersion Suits/TPA, provisions and fresh water* • *Prepare survival crafts* • *SART, EPIRB and VHF hand held radios* • *Additional Pyrotechnics and signals* • *Marshalling of survival crafts*	*4*		

5.2.6 Use of emergency steering *Describe:* *Typical arrangement of emergency steering.* *Change over from bridge to steering compartment*	2		
5.2.7 Arrangements for towing and being taken in tow : *Explain:* *Emergency towing requirements* *Contents of ETB* *Communications between two ships* *Methods of securing towing wire* *Preparations made by disabled ship*	3		
5.2.8 Rescue of persons from sea or from a vessel in distress *State:* *Waiting for day light,* *Provide a lee,* *Describe* *Methods of rescue when sea conditions are too dangerous to use boat* *Use of scramble nets* *Preparation of rescue boats and equipment* *First aid measures and medical care* *Recovery of rescue boats*	5		
6.1 Measures for assisting a vessel in distress: *Describe:* *Contents of IAMSAR,* *Various search pattern* *Signals to be made by ships & aircraft*	7		
6.2 / 9.3 Man-overboard procedures: *Describe:* *Initial actions,* *Use of man-overboard function in GPS* *Williamson, Single, Scharnow's Turn* *Preparations for rescuing man,* *Picking up man* *Picking up boat.*	8		
Competence No. 9: ***Manoeuvre the ship***			

9.1 Explain the *Effects of :* *Displacement, draught, trim, speed and under-keel clearance on turning circles and stopping distances* *Outline:* *Provision and display of Manoeuvring DATA* *Define:* *Advance, transfer, drift angle,* *Tactical diameter, track reach,* *Head reach, side reach,* *Turning circles of a ship, directional stability* *Compare:* *Turning circles for different speeds, load conditions.* *Stopping distances in load and ballast conditions.*	6		
9.2 Effect of wind and current on ship handling : *Explain:* *Pivot point of vessel* *Effect of wind depends on Wind strength, relative direction, windage area of ship, draft, trim* *Describe:* *Effect of current on motion of the ship*	4		
9.4 Squat and shallow-water and similar effects : *Define :* *Shallow water as depth less than 1.5 times draught* *Squat* *Bank Effect* *State :* *Shallow water effect as-* *Increase in turning radius, reduction in speed, reduction of UKC, trim change, increased vibrations.*	5		

9.5 Proper procedures for anchoring and mooring: *Describe* *Procedures for clearing anchors* *Safety measures by anchor party* *Procedure for anchoring* *Correct terminology for communication* *Use of anchor buoys* *Marking of the cable* *Sealing of spurling pipes* *Securing anchors for sea.* *Joining of two mooring ropes* *Procedure for rigging Pilot ladder/ Combination ladder The use of Slip Wire* *Precautions whilst making fast tugs* *Explain:* *Mooring plan* *Optimum mooring pattern and rope leads.* *Dangers of using different rope types in one mooring system. Use of fenders*	4		
TOTAL	131	8	

TOTAL BRIDGE WATCHKEEPING & EMERGENCIES : 139 Hours

TOPICS	Teaching method/hours		
	Lectures	***Exercise***	***Practical***
Properties, characteristics of substances covered by different classes. *Marking, Labelling and placarding of dangerous goods.* *Information to be available prior commencement of cargo work (quantity, types of package, proper shipping name, classification, stowage, segregation and any special measures)* *Use of IMDG code,* *Precautions to be taken while working with IMDG cargo,* *Preparation of space, precautions to be observed during loading and discharging of explosives.* *Maximum quantity of explosives that can be carried.* *MFAG, EmS, IMGS.* *Stowage and segregation requirements as per segregation tables.*			
10.3.2 Keeping a safe deck watch in port when carrying hazardous cargo : *Define:* *Hazardous cargo* *Explain:* *Special requirements when carrying hazardous cargo* *Procedure for entry into enclosed spaces and permit to work and for rescue.*	*2*		
10.3.3 Bulk cargoes (other than grain): *Explain:* *Contents and objective and information available in IMSBC code.* *Define:* *Angle of repose, flow moisture point, flow state, transportable moisture limit.* *Describe:* *Preparations of holds prior to loading bulk cargoes,* *Separation between bulk cargoes/ package of dangerous goods.* *Hazards associated with bulk cargoes and precautions prior, during and after loading of :* *Coal, sulphur, iron ore, urea.*	*3*		
10.3.4 Bulk grain cargoes: *Define:* *Grain, Filled compartment, Partly filled compartment.* *Explain:* *Purpose and contents of International Grain code.*	*3*		

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Competence 13: Maintain sea-worthiness of the ship			
13.1. Ship construction(Including corrosion and maintenance of Hull and fittings)			
13.1.1 Ship dimensions and form: *Illustrate :* *Mid-ship section,* *General cargo ships,* *Oil, chemical and gas tankers,* *Bulk carriers,* *Combination carriers,* *Container ships,* *Ro-Ro ships* *Passenger ships* *Side elevation and plan layout of:* *General cargo ships,* *Oil, chemical and gas tankers,* *Bulk carriers,* *Showing holds/ tanks, engine room, hatchways, DB tanks, peak tanks and position of bulkheads* *Define:* *Camber, Rise of floor, Flare, Shear, Rake, Parallel middle body,*	*9*		
13.1.2 Ship stresses : *Explain:* *Hogging,* *Sagging,* *Racking,* *Panting,* *Pounding,* *Slamming* *Torsion stresses* *Localized loading* *Water pressure loads on ship's hull* *Liguid pressure loads on tank structures* *Shear Force and Bending moments.* *Describe* *Constructional features to compensate for above stresses.*	*6*		
13.1.3 Hull structure : *Explain:* *Standard steel sections (flat plate, offset bulb plate, equal angle, unequal angle, channel, tee).*	*10*		

Effect of ice accretion on KG *Absorption of water/ moisture by deck cargo.* *Exercises on shift of 'G'(including ship stability booklet)*			
13.2.5 Initial stability : Up to 10^0 angle of heel *Define:* *Transverse metacentre* *State for small angles of heel meta centre can be considered as fixed point.* *Explain:* *KM is dependent on draft.* *KM-KG=GM (metacentric height)* *For small heel GZ= GM Sin θ* *For a ship to be stable, GZ should be positive.* *Use of hydrostatic curves to find KM.* *Effect of movement of 'G' on values of GZ.* *State* *That for a normal ship, the minimum initial GM should not be less than 0.15 meters* *Calculate GM of the ship given weights and centre of gravity of various compartments.*	4	4	
13.2.4 Statical stability : *Define:* *Righting lever,* *Righting moment* *Explain:* *How variations in draft affect GZ and stability of ship.* *Calculate GZ values based on displacement, draft and density.*	3		
13.2.7 Curves of statical stability : *Explain:* *KN curves* *Curves of statical stability* *Use of curve to determine range of stability, maximum value of GZ and angle at which it occurs, angle of vanishing stability.* *Risk of flooding at angle of heel beyond 40 degrees* *Derive the formula GZ= KN- KG sin θ*	1.5	1.5	

TOPICS	Teaching method/hours		
	Lectures	*Exercise*	*Practicals*
Garbage management plan *Entries in Garbage record book* ***2) Ballast Water Management*** *Explain:* *Discharge criteria.* *Ballast water management plan* *Various methods of ballast exchange* *Precautions during ballast exchange* *Testing of ballast* *Methods of control of organisms.* ***12.2.11 Annex VI - Air pollution*** *Explain* *SECA(Sulphur Emission Control areas)* *Describe:* *Control measures* *Special areas* *Volatile Organic Compounds(VOC) management plan* ***12.3 Proactive measures*** *Explain:* *Proactive measures to protect the marine environment*	2 2 1		
Competence-No. 17: Monitor compliance with legislative requirements			
17.1 IMO conventions *Explain:* *Contents, objectives, application and latest amendments :* *SOLAS Ch.III, IV, V, IX, & XI* *LSA, FSS* *MARPOL* *Load Line* *ISM Code* *ISPS Code* *STCW 2010* *IGF Code* *Polar Code*	4		
17.2 Safe working practices : *Describe:* *Contents, Objectives of:* *Code of Safe Working Practices* *Describe:* *Precautions and procedures to follow:-* • *Working aloft* • *Working over side* • *Entry in enclosed spaces* • *Handling ropes and wires*	5		