

RECOMMENDED MINIMUM EQUIPMENT, MATERIALS, CHEMICALS & TEACHING AIDS GOVERNING THE OPERATION OF THE BACHELOR OF SCIENCE IN MARINE TRANSPORTATION PROGRAM. HOWEVER, THE EXACT QUANTITY REQUIRED SHOULD CONFORM WITH THE CARRYING CAPACITY OF THE INSTITUTION.

DECK	
1.	Lecture Room
2.	Chart Room
3.	Navigational Equipment
4.	Ship's Bridge Simulator Room
5.	MARCOM Room
6.	Seamanship Room

ITEMS	QUANTITY REQUIRED
<p>1. LECTURE ROOM "The standard classroom shall be a minimum of 30 square meters for a class of 25 students and 56 square meters for a class of 50 students". Classrooms must be well-lighted and well-ventilated. It should contain the following:</p>	
<p>1.1 Tables and Chairs or Armed chairs 1.2 Whiteboards/Chalkboards 1.3 Multimedia Equipment 1.4 Teacher's Table</p>	
<p>2. CHART ROOM The ratio of the minimum requirements herein listed shall be proportionate to the total number of maritime students enrolled for the particular course under the following:</p>	
<p>2.1 Chart tables (Dimension: at least 1.0m L x 0.7m W) (ref: IMO MC 7.03, page 10)</p>	<p>Chart tables ratio: 1 table is to 2 students (1:2)</p>
<p>2.2 Navigational charts</p> <ul style="list-style-type: none"> ▪ Harbor charts – not necessarily of the same chart no. but should be adequate to create one passage plan (scale: larger than 1:50,000) 	<p>1 chart per table</p>

ITEMS	QUANTITY REQUIRED
<ul style="list-style-type: none"> ▪ Coastal charts – not necessarily of the same chart no. but should be adequate to create one passage plan (scale: 1:50,000 to 1:150,000) ▪ General charts – not necessarily of the same chart no. but should be adequate to create one passage plan (scale:from 1:150,000 to 1:600,000) ▪ Sailing charts – not necessarily of the same chart no. but should be adequate to create one passage plan (scale: smaller than 1:600,000) 	<p>1 chart per table</p> <p>1 chart per table</p> <p>1 chart per table</p>
<ul style="list-style-type: none"> ▪ Chart projections <ul style="list-style-type: none"> ▪ Gnomonic ▪ Mercator plotting sheet from equator to 90 degrees latitude ▪ Routeing chart 	<p>1 set</p> <p>1 set</p> <p>1 set (Jan – Dec)</p>
<p>2.3 Parallel rulers Navigational triangles Compass Dividers</p>	<p>10 pcs</p> <p>3 pairs</p> <p>3 pairs</p>
<p>2.4 IALA Maritime Bouyage System (Drawing/ Illustration)</p>	<p>2 pcs</p>
<p>2.5 Publications (photocopy acceptable)</p> <ul style="list-style-type: none"> ▪ Pilot Book / Sailing Directions 	<p>3 books of different publications</p>
<ul style="list-style-type: none"> ▪ Weekly notice to Mariners 	<p>6 pcs</p>
<ul style="list-style-type: none"> ▪ Radio Signals, Radio Time Signal Aids, Radio Navigational Warnings 	<p>Vol 1-6</p>
<ul style="list-style-type: none"> ▪ Nautical Tables (e.g. HO publications) or Useful tables 	<p>1 pc</p>
<ul style="list-style-type: none"> ▪ Nautical Almanac 	<p>1 pc (at least within the last 5 years edition)</p>
<ul style="list-style-type: none"> ▪ Tide Tables 	<p>1 pc (at least within the last 5 years edition)</p>
<ul style="list-style-type: none"> ▪ Sight Reduction Tables 	<p>1 set</p>
<p>2.6 Maneuvering Board</p>	<p>20 pcs</p>
<p>3.0 LIST OF NAVIGATIONAL EQUIPMENT</p> <ul style="list-style-type: none"> ▪ Equipment shall be fully operational ▪ Equipment may be live stand alone or integrated to a bridge simulator room ▪ Some equipment may be found in the ship’s bridge simulator room and/or in a separate dedicated room 	

I T E M S	Q U A N T I T Y R E Q U I R E D
3.1 Global Positioning System (GPS)	1 unit
3.2-Gyro compass with at least one repeater	1 set
3.3 Pelorus/ Azimuth Circle	1 pc
3.4 Echo sounder	1 unit
3.5 RPM/Speed Indicator	1 unit
3.6 Steering equipment with automatic pilot	1 unit
3.7 Bridge/ engine room telegraph	1 unit
3.8 Hygrometer (dry and wet bulb thermometer)	2 pcs
3.9 Anemometer (marine type)	1
3.10 Aneroid Barometer (marine type)	1
3.11 Weather Facsimile receiver or any equipment capable of giving weather report	1
3.12 Marine chronometer	1
3.13 Marine Sextant	2
3.14 Magnetic compass	1
3.15 Signaling lamp	1
3.16 International signal flags	1 set
3.17 Clinometer	1
3.18 Automatic Identification System (AIS)	1 unit
3.19 Appropriate equipment for giving light and sound signals (e.g. bell, gong, ship's whistle, morse light, etc.)	1 set
3.20 Equipment for display signals (lights and shapes):	
3.20.1 Anchor ball	2 pcs
3.20.2 Diamond shape	2 pcs
3.20.3 Cylindrical shape	2 pcs
3.20.4 Anchor light	1 pc
3.20.5 Not under command light	1 pc
3.20.6 Light to indicate "vessel restricted in her ability to manoeuvre"	1 pc

I T E M S	QUANTITY REQUIRED
<p>4.0 SHIP'S BRIDGE SIMULATOR ROOM</p> <p>4.1 GENERAL REQUIREMENT</p> <p>Instruction and assessment in RADAR-ARPA and ECDIS shall be conducted with the use of simulator equipment.</p> <p>4.1.1 The design, features and capabilities of the simulators used shall be in compliance with Regulation I/12 and guidelines under Section A-I/12 and B-I/12 of the 1978 STCW as amended.</p> <p>4.1.2 The installation must be capable of covering all the competences and KUPs as stated in the Table of Competence A-II/1 of the STCW Code related to RADAR-ARPA and/or ECDIS.</p> <p>4.1.3 The number of student stations shall be adequate in order for each student to undergo the minimum required exposure to the equipment</p> <p>4.1.4 There must be an INSTRUCTOR STATION where exercises are generated and are able to monitor each student station during an exercise or assessment</p> <p>4.1.5 All other simulators which can be used by the MHEIs for other competences shall follow the same guidelines as in item number 4.1.1.</p> <p>RADAR/ARPA AND GMDSS COMMUNICATION SIMULATOR MAY BE LOCATED IN DEDICATED SIMULATOR ROOM OR THEY MAY BE INTEGRATED TO A BRIDGE SIMULATOR.</p> <p>The ratio of the minimum requirement for simulator equipment to student shall be as follows:</p> <p>Academic Year 2015-2016 – 1:5 Academic Year 2016-2017 – 1:5 Academic Year 2017-2018 – 1:4 Academic Year 2019-2020 – 1:3</p>	

I T E M S	QUANTITY REQUIRED
<p>4.2 OTHER REQUIREMENTS</p> <p>4.2.1 Navigational charts corresponding to particular coast or harbor must be available in the simulator room</p> <p>4.2.2 Parallel rulers / Navigational triangles</p> <p>4.2.3 Compass divider</p>	<p>1 set for each work station</p>
<p>5.0 MARCOM ROOM - GMDSS / COMMUNICATION SIMULATOR</p>	
<p>5.1 GMDSS simulator capable of simulating the following: DSC, NAVTEX, EPIRB, Satellite communication for a particular GMDSS area.</p> <p>5.1.1 Instructor/Student and GMDSS station ratio</p> <p>5.1.2 GMDSS operation able to meet the training objectives to include the determination of limitations and possible errors of the equipment.</p> <p>5.1.3 Able to provide controlled operating environment capable of producing various conditions such as, emergency, hazardous or unusual situations relevant to the training objective.</p> <p>5.1.4 Provide an interface through which a trainee can interact with the equipment, and the simulated environment.</p> <p>5.1.5 Allow an instructor to control and monitor exercises.</p> <p>5.2 International Radio Laws (ITU) Part I and Part II</p> <p>5.3 Admiralty List of Radio Signals (Vol. I & II) [may be found in the Chart Room]</p> <p>5.4 INMARSAT Maritime Communication Handbook</p> <p>5.5 International Code of Signals</p> <p>5.6 Morse Signaling Apparatus</p> <p>5.7 Semaphore Flags</p> <p>5.8 Single Letter Flags</p> <p>The ratio of the minimum requirement for GMDSS simulator equipment shall be as follows:</p> <p>Academic Year 2015-2016 – 1:5 Academic Year 2016-2017 – 1:5</p>	<p>As per performance standards adopted by the IMO</p> <p>1 set</p> <p>1 set</p> <p>1 pc</p> <p>1 pc</p> <p>1 set</p> <p>2 sets</p> <p>1 set</p>

I T E M S	Q U A N T I T Y R E Q U I R E D
<p>Academic Year 2017-2018 – 1:4 Academic Year 2019-2020 – 1:3</p>	
6.0 SEAMANSHIP ROOM	
<p>6.1 Work benches</p> <p>6.2 Vises attached to work benches for splicing</p> <p>6.3 Models/Drawings/Video of the following:</p> <ul style="list-style-type: none"> ▪ Derrick (single or married fall system) ▪ Deck crane ▪ Anchor windlass ▪ Mooring winch/capstan ▪ Hatch cover (any type, complete parts) ▪ Head and heel blocks ▪ Types of vessels ▪ Various hatch covers <p>6.4 Samples of cargo plans of at least 4 types of ships</p> <p>6.5 Bollard</p> <p>6.6 Bitts</p> <p>6.7 Cleats</p> <p>6.8 Anchor with chain</p> <p>6.9 Chipping hammer</p> <p>6.10 Hand scraper, angular</p> <p>6.11 Long handled scraper</p> <p>6.12 Wire brush</p> <p>6.13 Fid</p> <p>6.14 Marlinspike (6-10 inches)</p>	<p>6</p> <p>12</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1 each</p> <p>1</p> <p>1</p> <p>1 each</p> <p>2</p> <p>2</p> <p>2</p> <p>1</p> <p>10</p> <p>10</p> <p>10</p> <p>10</p> <p>10</p> <p>10</p> <p>10</p>

I T E M S	Q U A N T I T Y R E Q U I R E D
6.15 Rope, at least 12mm in diameter (nylon or Manila rope)	100mtr
6.16 Wire rope for splicing, at least 8mm in diameter	30mtr
6.17 Seaman's knife	10
6.18 Sewing palms and kit for canvass works	1 set
▪ Sewing needle	
▪ Eyelet	
▪ Canvass or tarpaulin	
▪ Thimble (for sewing)	
▪ Punch and Dye	
6.19 Serving mallet	1
6.20 Pilot ladder	1
6.21 Jacob's ladder	1
6.22 Wire cutter	1
6.23 Painting stage w/rigging	1
6.24 Boatswain chair	1
6.25 Cargo net	1
6.26 Safety net	1
6.27 Gun tackle	1
6.28 Two-fold purchase rigged preferably on wooden blocks	1
6.29 Three-fold purchase rigged preferably on wooden blocks	1
6.30 Metal cargo swivel block	1
6.31 Cargo hook SWL at least 5 tons	1
6.32 Chain block, at least 1 ton	1
6.33 Snatch block, size at least 160mm	1
6.34 Safety helmet	25
6.35 Safety goggle	25
6.36 Safety Belt/Safety Harness	3
6.37 Working gloves	25
6.38 Thimble	6
6.39 Shackle (various sizes)	6
6.40 Turnbuckle	6
6.41 Ships Certificates e.g. SOLAS, etc.	At least 5
6.42 Ships Organizational Chart	1
6.43 Tabular Chart for the strength of ropes and wires	1
6.44 IMDG Code: Labels, marks and signs (SN: IMO-220E)	1
6.45 Drawings of various tanker ships showing tanks, pipes	1
and pumping arrangement (oil, chemical & gas)	1
6.46 Drawings/illustration/actual equipment of measuring	
device and oxygen device	1
6.47 Copy of actual Ship Capacity Plan/Dead Weight Plan	
6.48 Trim and Stability Table	1
6.49 International Loadline Chart (seasonal Chart)	1

I T E M S	QUANTITY REQUIRED
6.50 Computer based software on Trim and Stability [may be found in a separate room]	1 1
6.51 Diagram of a Ship's Maneuvering Characteristics	
6.52 Posters/pictures of River, Bends, Locks, Port Facilities, Navigable canals, rivers, etc.	1 1
6.53 Posters/pictures of various types of propellers and bow-thruster	1

Summary of Courses that may need Bridge Simulator

Courses	Simulator
Navigation 1, 3, 7	Any of categories 1, 2, and 4
Navigation 5, 6	Any of categories 1, 2, 3 and 4
D-Watch 2 - Deck Watchkeeping	Any of categories 1, 2, and 4
Seam 5 – Ship Handling and Maneuvering	Any of categories 1, 2, 3 and 4

Standard Classification of Ship's Bridge Simulator

CATEGORY 1	Full Mission Simulator	A full mission simulator capable of simulating a total shipboard bridge operation situation including the capability for advanced maneuvering in restricted areas.
CATEGORY 2	Multi Task Simulator	A multi task simulator capable of simulating a total shipboard bridge operation situation but excluding the capability for advanced maneuvering in restricted waterways.
CATEGORY 3	Limited Task Simulator	A limited task simulator capable of simulating a shipboard bridge operation situation for limited (instrumentation or blind) navigation and collision avoidance.

CATEGORY 4	Special Task Simulator	A special task simulator capable of simulating operation and/or maintenance of particular bridge instruments and/or defined navigation/ maneuvering scenarios.
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Competences addressed by the Ship's Bridge Simulator

STCW Reference	Competence	Category			
		1	2	3	4
Table A-II/1.1	Plan and conduct a passage and determine position	✓	✓		✓
Table A-II/1.2	Maintain safe navigational watch	✓	✓		✓
Table A-II/1.3	Use of RADAR and ARPA to maintain safety of navigation	✓	✓	✓	✓
Table A-II/1.4	Use of ECDIS to maintain the safety of navigation	✓	✓	✓	✓
Table A-II/1.5	Respond to emergencies	✓	✓	✓	✓
Table A-II/1.6	Respond to distress signal at sea	✓	✓	✓	✓
Table A-II/1.8	Transmit and receive information by visual signaling	✓	✓	✓	✓
Table A-II/1.9	Maneuver the ship	✓	✓	✓	✓