BS MARINE ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

Graduates of the Marine Engineering Program are expected to attain the following objectives 3 to 5 years after graduation:

- Shall have been recognized marine engineer officers and ratings in accordance with the IMO-STCW '78 standards as amended, other national and international laws and conventions.
- Shall have been socially-involved marine engineer officers and ratings who actively contribute to the development and advancement of the local, national and global communities.
- Shall have initiated innovations in the advancement of the maritime profession and industry as marine engineering officers and ratings who actively engage in continuous professional development, training and research.

STUDENT OUTCOMES (SOs) AND PERFORMANCE INDICATORS (PIs)

The Marine Engineering student should attain the following by the time of graduation:

a. Maintain a safe engineering watch

Performance Indicators
a1. Understand proper engineering watch procedure, including duties associated with taking over and accepting a watch, routine duties undertaken during a watch, maintenance of the machinery space logs and the significance of the readings taken, duties associated with handing over a watch.

- a2. Determine safety precautions during a watch.
- a3. Conduct safety and emergency procedures in an engineering watch, change-over of remote/automatic to local control of all systems.
- a4. Implement immediate actions in the event of fire or accident, with particular reference to oil systems.
- a5. Manage engine room resource through allocation, assignment and prioritization.
- a6. Demonstrate engine-room resource management principles.

b. Operate, maintain and repair electrical/electronic equipment

Performance Indicators
b1. Detect electrical malfunction, location of faults and implement measures to prevent damage.

- b2. Analyze electrical problems and provide appropriate solutions.
- b3. Apply principles of the different electrical, electronic and control equipment such as generator and distribution systems.
- b4. Prepare, start, use in parallel and change over generators and electrical motors.
- b5. Interpret electrical and simple electronic diagrams.
- b6. Maintain and repair electrical system equipment, switchboards, electric motors, generator and DC electrical systems and equipment.

c. Operate main and auxiliary machinery and associated control system

Performance Indicators
c1. Apply the operational principles of machinery systems.

- c2. Plan and schedule steam plant operations.
- c3. Operate fuel, lubrication, water and air starting system.
- c4. Operate marine boiler and associated control system.

d. Maintain and repair shipboard machinery and equipment.

Performance Indicators
d1. Demonstrate appropriate mechanical knowledge and skills.

- d2. Dismantle, adjust and reassemble machinery and equipment.
d3. Interpret machinery piping, hydraulic and pneumatic diagrams.
d4. Use appropriate specialized tools and measuring instruments
d5. Apply safety measures including the safe isolation of shipboard machinery and equipment required before personnel are permitted to work on such machinery or equipment.
d6. Design and select materials in construction of equipment

e. Apply different techniques of technical drawing and letterings

*Performance Indicators*

e1. Demonstrate skills in drawing techniques and measuring instruments for engineering drawing.
e2. Apply pictorial projection and dimension in the design of the different parts of the machine.

f. Apply safety procedures in all areas.

*Performance Indicators*
f1. Demonstrate skills in personal survival techniques.
f2. Explain fire prevention and demonstrate ability to fight and extinguish fires.
f3. Perform elementary first aid.
f4. Relate personal safety and social responsibilities

**g. Utilize different power and hand tools to shipboard operation, maintenance & repair.**

*Performance Indicators*
g1. Classify materials used in construction and repair of ships and equipment.
g2. Determine processes used for fabrication and repair.
g3. Identify methods, hand tools, machine tools and measuring instruments for carrying out safe emergency/temporary repairs.
g4. Implement safety measures to ensure a safe working environment.

**h. Implement emergency and damage control plans and handle emergency situations.**

*Performance Indicators*
h1. Differentiate classes and chemistry of fire.
h2. Demonstrate knowledge of fire-fighting systems.
h3. Develop action plan to be carried out in the event of fire, including fires involving oil systems.
h4. Organize fire and abandon-ship drill.
h5. Operate survival craft and rescue boats, launching appliances and arrangements, and equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids (TPA).
h6. Apply medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship.

**i. Communicate and collaborate in group operations.**

*Performance Indicators*
i1. Practice English in written and oral form.
i2. Utilize internal communication systems.
i3. Apply task and workload management, including planning and co-ordination, personnel assignment, time and resource constraints and prioritization.
i4. Apply decision-making techniques in situation and risk assessment.
i5. Select course of action and evaluate outcome effectiveness

**j. Comply with pollution prevention requirements**

*Performance Indicators*
j1. Apply knowledge of relevant IMO conventions on safety of life at sea, security and protection of the marine environment.
j2. Determine the precautions to be carried out to prevent pollution of the marine environment.
j3. Explain anti-pollution procedures and identify all associated equipment.
j4. Use proactive measures to protect the marine environment.