5334 - SHIPREPAIR ENGINEERING

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
Lectures	Practical	Credits			Theory		Practical Ex.	Total
3	2	5	25	25	3 Hrs	100	25 or	175

Pre-requisite	Source	Semester	Theory	Test	Total	TW	PR	Gr Total
Nil	SHB	4	75	25	100	25	25	150

(Updated upto 05-10-2001)

Rationale: The course content is designed to meet the needs of the present day ship repair yards. The engineer is trained: To know how to dock vessels when it is brought for repair work. To identify the areas which need repairs. To acquaint themselves with various aspects of survey carried out when vessel is in the dock. To know the regular maintenance aspects of vessels and how it is maintained under class.

COURSE CONTENTS	Hrs	Mks
1. Ship Repair facilities Docking systems, description, comparison, deck equipment, services to ships in dock. Supporting repair shops, nature of jobs involved in ship repairs. Docking plan details and significance. Procedures for docking/undocking. Safe working practice.	06	12
2. Hull Repairs Hull surveys, types of defects, methods of gauging, limits of acceptance, areas of maximum wastage, areas susceptible to erosion, buckling, dents, cracks, etc. Preparation for hull repairs, cleaning, gas freeing, ventilation, access, staging, additional supports, removal of blocks. Procedure for repairs, sequence of gas cutting, fitting and welding. Fitting doublers and inserts. Marking, use of templates for odd size and shape. Temporary repairs, cement box testing of repaired areas and compartments.	06	12
3. Repairs of underwater equipment Withdrawal of propeller and tail end shaft. Propeller drops measurement. Inspection and repairs of propeller, shaft, seals, stern tube and a bracket bearing, Static balancing. Rudder drop measurement. Rudder removal, repairs and refitting. Repairs of Rudder stock, pintles, bushes. Trials in dry dock. Ranging anchors and cables. Inspection, gauging, acceptable values Rearrangement. Repairs of chain links, shackles and anchor. Sea chest and connections. Underwater fittings. Anodes cathodic protection. Dry docking survey.	06	12
4. Repairs of hull fittings and equipments Load line survey and repairs. Hatch covers watertight doors, tank manholes, scuttles, air pipes, freeing ports, railing, bulwark. Testing water tightness of closing appliances. Masts, ventilators, hawse pipe, scuppers, lifeboat davits, derricks, cargo gear inspection, repairs and testing. Pipe line repairs. Use of planks and spectacle flanges. Making template and Fabrication of pipe. Insulation, expansion joints, clamps, pipe testing.	06	12
5. Hull Protection and Insulation Method of descaling. H.P. water wash, sand blasting, chipping, standards of surface finish. Painting scheme for underwater hull, shipside, deck, cargo hold, ballast tank, f.w. tank, superstructure. Deck sheating, flooring, deck composition, bulkhead insulation, panelling.	03	06
6. Repairs and maintenance of Main and Aux. Diesel Engines. Maintenance schedule. Crank case inspection. Procedure for dismantling, component inspection/calibration, maintenance, adjustment and re-assembly. Overhead and calibration of fuel pump and fuel injec[illegible]e-commissioning and trails. Reduction gear maintenance.	07	16

7. Repairs and maintenance of Auxiliaries. Boilers and boiler mountings, steam condenser, steam heater, fresh water generator. Air compressor, centrifugal pump, reciprocating pump, gear pump, heat exchanges. Steering gear, telemotor, deck cranes, windlass, winches.	08	16
8. Maintenance of Safety Equipment's. Safety equipment surveys. Annual inspection procedure, boat and fire drill. Repairs of fibre glass boats, inflatable life rafts and life buoys. Renewal of wire ropes and cordage's. Testing and recharging fire extinguishers of various types. Weighment and Servicing CO2 bottles. Testing CO2 system by compressed air. Maintenance and testing of fire mains, hydrants, hoses and nozzles.	03	08
9. Office Procedure and Costing Defect list, quotation, job order and work done certificate. Records of repairs & maintenance shell expansion and structural plans. History Sheet for machinery maintenance. Gauging, calibration, tests and trial reports. Costing, cost components. Estimation of material, manpower and time requirement. Direct and indirect cost. Subcontract. Bill preparation.	03	06
Total	48	100

PRACTICAL: -

Sketching & describing Docking plan of a ship showing points of support.
Areas of wastage on a vessel under repairs, Propeller shaft inspection, withdrawal, reconditioning and refitting, Anchors & cables inspection & repairs, Guidelines to repair of pipelines, Painting scheme for a ship, Diesel engine maintenance – procedure, component inspection and calibration.
(Actual observations from an engine under repairs), Specimen of defect list, job order, work completion certificate.

REFERENCE BOOKS: -

1. Ship repair Technology by D. Benkovsky & others.