GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

Competency-focused Outcome-based Green Curriculum-2023 (COGC-2023)
Semester-V

Course Title: Marine Engineering Project-I
(Course Code: 4351803)

Diploma programmer in which this course is offered	Semester in which offered
Marine Engineering	5th Semester

1. RATIONALE

For every Marine engineer officer it is key to understand the operations of Main and Auxiliary machinery. It is a key to marine engineer that they should be aware of the machinery they have to work on so as to carry out a safe working marine practice A Marine engineer must be able to maintain and to understand the source of problem and should know how to overhaul any machineries keeping all the parameters like clearances, position, size etc in mind. Understanding the routine maintenance of working with electrical machineries .To manage safe and effective maintenance and repair procedures, ensure safe working practices.

2. COMPETENCY

The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competencies:

1. To develop of inquisitive rush, innovative skill and confidence to workindependently.
2. To participate effectively in group work.
3. To collect relevant data.
4. To plan and organize the work.
5. To analyze and synthesize the data.
6. To relate knowledge various courses in lacking a live problem.
7. To make appropriate decision to solve rapid problems arising while carrying outpractical work.
8. To develop ability during field project work.
9. To develop cost consideration.
10. To design the components on broad lines.
11. To prepare a drawings and plans for works.
12. To assess the financial implication and feasibility of the scheme.
13. To prepare the technical reports.

3. COURSE OUTCOMES (COs)

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive and affective domain to demonstrate following course outcomes.

CO-1	Plan and identify materials, processes and other resources optimally.

CO-2	Develop innovative and creative ideas.
CO-3	Develop leadership, interpersonal skill and team work.
C0-4	Adopt changes in technology Familiar with environment responsibility.
CO-5	Interpret the drawings and Purchase raw material/standard parts for manufacture, assemble, inspect project work.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P/2)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	CA	ESE	CA	ESE	
0	0	4	2	-	-	50	50	100

Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P- Practical; **C**-Credit; **ESE**-End Semester Examination; PA- Progressive Assessment.

5. COURSE DETAILS

*Each Project batch must not exceed 8 students.

During the semesters, Students will have to write two types of reports.

1. Course-work reports : i.e. reports for communication with your tutor or guide ,
   Technical reports to communicate with a specific individual who might be a „senior" person in the formats specified by Gujarat Technological University.
2. A summary of work carried out, the readings, calculations, results and answers in numerical or graphical form, and a discussion of the results, answers and conclusions. Effort should be made to identify actual field problems to be given as project work to the students. Project selected should not be too complex which is beyond the comprehension level of the students. The placement of the students for such a practical cum project work should match with the competency profile and interest of students. Students may be assessed by polytechnic faculty. The suggested performance criteria is given below:
   a) Punctuality and regularity (Log book – mandatory to record all the progress of project)
   b) Initiative in learning/working at site
   c) Level/proficiency of practical skills acquired
   d) Sense of responsibility
   e) Self-expression/Communication skills
   f) Interpersonal skills.
   g) Report writing skills
   h) Viva voce

Some of suggested projects are given below: These are only guidelines; teacher may take any project related to Civil Engineering depending upon the availability of projects. Preference should be given to

practical oriented projects. According to the local needs. The following major projects are suggested:

1. **Marine Boilers**
   - Cross section of any type of boiler eg. water tube or fire tube boiler.
   - Showing the inner layers and boiler mountings from bottom furnace to steam drum which include heat exchangers, water drum, water level gauge glass, safety valve, steam traps etc.
   - Waste heat boilers also known as economizers which take heat from the main engine so as to reduce the fuel oil consumption.
   - Step by step method of starting Boiler from a cold condition considering all the stresses acting and to raise steam to a desired working pressure.
   - Various types of burners used to atomize fuel and the maintenance required and the term Blowback and how to avoid them.
   - The need and method of using soot blower.
   - Different types of stay used in boiler and advantages of using corrugated furnaces.
2. **Steering Gear system**
   - Types of steering gear two ram or four ram.
   - Functions of steering gear and telemotor system.
   - Working of electric or hydroelectric steering gear systems.
   - Emergency starting procedures.
   - SOLAS and class requirements of steering gear system including single failure criteria.
   - 50% and 100% redundancy.
3. **Oily Water Separator**
   - Why it is necessary to have an O.W.S onboard every ship.
   - Construction of O.W.S showing all the stages from intake from bilge tanks up till overboard to sea.
   - Construction or operation of oil content monitoring equipments.
   - MARPOL regulations to be considered while designing O.W.S in order to prevent the contamination of sea water by oil
   - Use of 15 ppm monitor, three way valve directions.
   - use of probe and showing the separated oil from O.W.S and oil collecting space and its way back to bilge tanks.
4. **Sewage Treatment Plant**
   - Operation and construction of S.T.P
   - MARPOL regulations of discarding the sewage onboard.
   - BOD in sewage treatment plant and its uses.
   - Stages of sewage treatment plant.
   - Components of STP viz. biofilter, chlorinator, sedimentation chamber, float and level switches etc.
   - Precautions for efficient operation of STP.
   - Range of pH of samples of effluent.
   - Procedure for starting and stopping of STP.
   - Processes involved in biochemical digestion of sewage.
   - Methods to check sewage effluent.

5. **Heat Exchanger**
   - Construction methods of heat exchanger.
   - Applications of heat exchangers on board ship.
   - Selection of heat exchangers based upon requirements.
   - Heat Exchangers design characteristics viz. flow configuration, heat transfer mechanism.
   - Heat exchanger components and materials.
   - Design considerations of heat exchangers such as thermal output, costs, size limitations.
   - Optimization of the design and the type of heat exchanger according to the given conditions.
6. **Purifier**
   - Construction and operation of a purifier.
   - Design consideration using gravity disc and pairing disc.
   - Difference between purifier and clarifier.
   - Changeover of purifier from heavy fuel oil to diesel oil.
   - State the uses of all three types of waters used for the purification process.
   - Using the nomograph state the selection of gravity disc.
   - Show the passage of oil from tanks, purified oil, separated water.
7. **Incinerator**
   - Construction and working principle.
   - Types of incinerator & which is more suitable and stating its reason.
   - Starting procedure using diesel oil and changing over to waste oil.
   - Segregation of waste considering MARPOL regulation.
   - Waste materials allowed for incineration according to their properties.
   - Suitable temperature of flue gases for maintaining the incinerator process.
   - State the uses of draft fan and its importance in incinerator.
   - Removal of ash after the incineration process.
8. **Fixed fire fighting system**
   - Choose any type of fixed fire fighting system and show its construction with its working.
   - Where to install the fixed fire fighting system and its importance.
   - New advanced technologies introduced.
   - An economic way to solve the complexity of the arrangement.
   - Detecting and eliminating fire within a specified time.
   - Use of FM200 over co2 and its advantages.
   - Where all it can be installed and when it should be used.
9. **Oil mist detector**
   - Construction and its working principle.
   - Where it is used and the importance of oil mist detector in marine main engines.
   - Showing the connection how alarm goes off when oil mist detector gets triggered.
   - Use of photoelectric cells and routine maintenance of oil mist detector.
   - Reasons stating the failures of an oil mist detector and preventing measures.
10. **Fabrication of a crane.**
    - Assembly of components of the crane.
    - safe working limit of various parts of the crane
    - Load carrying capacity according to design.
    - Various inspection checks carried out during the maintenance of a crane.
    - Type of material to be used for construction of crane.
    - Gantry crane and overhead crane comparison based upon design.

The project report should consist of following items.

1. Introduction
2. Literature survey
3. Study Area
4. Methodology/Design/Tests
5. Result and Discussion
6. Conclusion and scope for future study
7. References.

- One self appraisal form should be attached at the end by the student in his favor regarding the claim of his work relevance , utilities and materialization as well as the gain in terms of cost – benefits , so that teacher can have ease of evaluation.
- The Report should be submitted well before the Exam.

Guideline for the Project– II for Diploma Engineering

a. Prepare project report with MS Office with following guidelines.

PAGE: A4 (ON ONE SIDE).
MARGINN: TOP: 15mm.
BOTTOM :15mm.
RIGHT :15mm.
LEFT: 30mm.
FONT: ARIAL.
SIZE: 12-BOLD, CONTENT12,
SPACING 18 POINTS,
HEADER: TITLE OF THE PROJECT,
PAGE NUMBER ON TOP RIGHT.
FOOTER: ACADEMIC YEAR, SHORT NAME OF THE INSTITUTE

b. Term work (hard copy) should also include experience logbook duly certified by workshop instructors (as applicable), Industry/Market/Field personnel (as applicable) and subject teachers.

c. Term work has to be defended (along with term work of V semester) by practical / oral examination to be conducted by external and internal examiners. Power point presentation is also to be included.

6. SUGGESTED LIST OF STUDENT ACTIVITIES

Sr No	ACTIVITY
1	Suggest further improvement / research which can be carried out.

7. SUGGESTED LEARNING RESOURCES

A. List of Books:

i. Use of Library.
ii. Reference books.
iii. Hand books.
iv. Encyclopedia.
v. Magazines.

vi. Periodicals.
vii. Journals.
viii. Visits of industry, organizations related as per the requirement.
ix. Internet.

8. PO-COMPETENCY-CO MAPPING

Semester V	MARINE ENGINEERING PROJECT-I (Course Code: 4351803)						
	POs						
Competency & Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
	Basic & Discipline specific knowledge	Problem Analysis	Design/ development of solutions	Engineering Tools, Experimentation & Testing	Engineering practices for society, Sustainability & environment	Project Management	Life-long Learning
Competency	**Prepare production drawings using the computer and relevant software and following standards codes and norms**						
Course Outcomes							
CO-1) Plan and identify materials, processes and other resources Optimally.	**3**	**1**	**1**	**-**	**-**	**1**	**1**
CO-2) Develop innovative and creative ideas.	**2**	**1**	**1**	**-**	**-**	**-**	**1**
CO-3) Develop leadership, interpersonal skill and team work.	**1**	**1**	**1**	**-**	**1**	**-**	**1**
CO-4) Adopt changes in technology Familiar with environment responsibility.	**1**	**-**	**-**	**-**	**2**	**-**	**2**
CO 5) Interpret the drawings and Purchase raw material/standard parts for manufacture, assemble, inspect project work.	**2**	**2**	**3**	**2**	**-**	**1**	**1**

*Legend: '**3**' for high, '**2**' for medium, '**1**' for low and '**-**' for no correlation of each CO with PO.*

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

1. GTU Resource Persons

S. No.	Name and Designation	Institute	Contact No.	Email
1.	Dr.S.H.Sundarani BOS Chairman HOD Mechanical Engg	Government Polytechnic Ahmadabad	9227200147	gpasiraj@gmail.com
2.	Mr.D D Panchal Lecturer in Mechanical Engg.	Government Polytechnic Ahmadabad	9726993235	dhavalp0705@gmail.com
3.	Mr.N.N.Patel Lecturer in Mechanical Engg.	Government Polytechnic Ahmadabad	7016209858	niravptl42@gmail.com

17. BOS Resource Persons

Sr. No.	Name and Designation	Institute	Contact No.	Email
1.	Dr. S. H. Sundarani, BOS (Chairman & HOD Mechanical Engineering)	Government Polytechnic, Ahmadabad	9227200147	gpasiraj@gmail.com
2.	Dr. Rakesh D. Patel (BOS Member & HOD Mechanical Engineering)	B. & B. Institute of Technology, Vallabh Vidyanagar	9825523982	rakeshgtu@gmail.com
3.	Dr. Atul S.Shah (BOS Member & Principal)	B. V. Patel Institute of Technology, Bardoli	7567421337	Asshah97@yahoo.in

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CANDIDATE'S DECLARATION

I,.....a student of Diploma in……..

.....Department bearing PEN .....

.....of.....hereby declare that I own full Responsibility for the information, results and conclusions provided in this project Work titled ".....

---------- "submitted to Gujarat Technological University for the award of Diploma in –

----------.To the best of my knowledge, this project work has not been submitted in part or full elsewhere in any other institution/organization for the award of any certificate/diploma/degree. I have completely taken care in acknowledging the contribution of others in this academic work. I further declare that in case of any violation of intellectual property rights and particulars declared, found at any stage, I, as the candidate will be solely responsible for the same.

Date:

Place:

Signature of candidate

PEN: ---------- Name:----------

CERTIFICATE

Certified that this project report entitled --

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-----"which is being submitted by Mr./Ms. ………………………………………….., Reg. No……………….., a bonafide student of …………………………………..in partial fulfillment for the award of Diploma in Marine Engineering during the year

……………………. is record of students own work carried out under my/our guidance. It is certified that all corrections/suggestions indicated for internal Assessment have been incorporated in the Report and one copy of it being deposited in the polytechnic library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said diploma. It is further understood that by this certificate the undersigned do not endorse or approve any statement made, opinion expressed or conclusion drawn there in but approve the project only for the purpose for which it is submitted.

Guide

Examiners

1
2

Name and signature

Head of Department
Dept. of…………….