GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

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

Course Title: Environmental Engineering Project-I
(Course Code: 4351305)

Diploma programme in which this course is offered	Semester in which offered
Environmental Engineering	5th semester

1. RATIONALE

Environmental Engineering is emerging field that has gained lot of attention due to the problems faced by the society and environment due to industrial developments. Environmental Engineering Project work is a good options by which students gets exposure to emerging technology and familiarize themselves with industry environment to identify scope and focus of their career development opportunities. Main objective of Project is to apply the technical knowledge gained through the course curriculum to solve problems faced by the society and environment so that sustainable development is possible.

1. **Industry Defined Problem** - Student is suggested to select any Industry/Consultancy. Students are supposed to study the manufacturing process of the industry, the treatment plants and identify any problem related to air/water/solid waste management or any other pollution problem faced by the industry.
2. **User defined problem** – The faculty/mentor can suggest any problem related to college/society/environment and students can work upon it.

Out of 100 marks, 50 marks are to be given for Problem Definition. The college, through internal evaluation, will assess the Industry/User Defined problems, submitted by students during the third week of the fifth semester. The remaining 50 marks are for the practical exam, to be conducted by the University.

2. COMPETENCY

The purpose of this course is to help the student to attain the following industry identified competency through various teaching-learning experiences:

- **Develop multiple types of skills such as application of basic domain knowledge for problem analysis, design development of solutions by using engineering tools, testing and experiments for the benefit of society environment and sustainability.**
- **Acquire project management skills like planning, communication, teamwork and nurture curiosity for lifelong learning.**

3. COURSE OUTCOMES (COs)

The practical exercises, the underpinning knowledge, and the relevant soft skills associated with this competency are to be developed in the student to display the following COs:

The student will develop underpinning knowledge, adequate programming skills of competency for implementing various applications using python programming language to attain the following course outcomes.

a) Prepare project proposal.
b) Review literatures related to the project topic.
c) Define project problem considering concept of sustainable development of society
d) Analyze the problem.
e) Collect data/ design.
f) Lead or work as a member of a team.
g) Adhere to Safety norms
h) Observe ethical practices.
i) Communicate effectively.
j) Prepare project report.

4. TEACHING AND EXAMINATION SCHEME

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

CA and ESE Assessment will be carried out based on project work by Project Guide.

***Legends: L**-Lecture; **T** – Tutorial/Teacher Guided Theory Practice; **P** -Practical; **C** – Credit, **CA** - Continuous Assessment; **ESE** -End Semester Examination.*

List of Documents to be prepared for Submission:

1. Project Synopsis and problem definition , in the format prescribed by GTU, including
    - The details of the project selected by him/ her, the name and brief description of the organization, its address and the, Contact Person details etc.
    - Literature Survey and Research related to corresponding organization in the context of the Problem Objectives.
2. Final Project Report in the format prescribed by GTU
3. Project Presentation (PPT)

5. AFFECTIVE DOMAIN OUTCOMES

The following affective Domain Outcomes (ADOs) are embedded in many of the above-mentioned COs. More could be added to fulfill the development of this course competency.

a) Work as a leader/a team member as role of Engineer.
b) Practice environmentally friendly methods and processes.
c) Follow safety precautions and ethical practices.

6. SUGGESTED STUDENT ACTIVITIES

Following are the suggested student-related curricular, co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should perform following activities and prepare reports and give presentation in front of students and faculty members. They should also collect/record physical evidences for their (student's) portfolio which may be useful for their placement interviews:

a) Identify the organization and the study of organizational literature.
b) Study environment, manufacturing processes, Services, Industrial machineries as well as systems to find the problem.
c) Study Probable Problem solution for identified problem/s, area/s and probable strategies.
d) Understand the basic theory, study of the particular Systems /Services/Processes in the context of the abstract problem area/s.
e) After understanding the student will analyze the information, prepare list of probable requirements, the questions if any, the probable forecasting of hurdles which might be observed in future and finding the way outs.
f) The student will visit organization and prepare a Report on the Problem Definition.
g) Once the Problem is defined and submitted to GTU, the students will start working on the Problem. They have to undergo a rigorous process of Understanding and Analyzing the problem, conducting a Literature and Prior Art Search through studying patent literature, Deriving, Discussing and Designing the problem solution. The Implementation part may be completed in Semester-VI.

7. REFERENCE

GTU guidelines for diploma project

8. PO-COMPETENCY-CO MAPPING

Semester V	Environmental Engineering Project-I (Course Code: 4351305)						
	POs and PSOs						
Competency & Course Outcomes	**PO 1 Basic & Discipline specific knowledge**	**PO 2 Problem Analysis**	**PO 3 Design/ development of solutions**	**PO 4 Engineering Tools, Experimentation &Testing**	**PO 5 Engineering practices for society, sustainability & environment**	**PO 6 Project Management**	**PO 7 Life-long learning**
Competency Develop multiple types of skills such as application of basic domain knowledge for problem analysis, design development of solutions by using engineering tools, testing and experiments for the benefit of society environment and sustainability. Acquire project management skills like planning, communication, teamwork and nurture curiosity for lifelong learning.							
Course Outcome a) Prepare project proposal.	2	2	-	-	1	2	1
b) Review literatures related to the project topic.	2	2	-	2	-	2	-
c) Define project problem considering concept of sustainable development of society	2	1	-	-	3	2	2
d) Analyze the problem.	2	3	-	3	-	2	-
e) Collect data/ design.	2	-	3	-	-	2	1
f) Lead or work as a member of a team.	-	-	-	-	2	3	2
g) Adhere to Safety norms	2	-	-	-	-	2	2
h) Observe ethical practices.	-	-	-	-	2	2	3
i) Communicate effectively.	-	-	-	1	-	3	3

j) Prepare project report.	2	-	-	-	-	2	3

Legend: '**3'** for high, '**2**' for medium, **'1'** for low or **'-'** for the relevant correlation of each competency, CO, with PO/ PSO

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

GTU Resource Persons

Sr. No.	Name and Designation	Institute	Email
1	Mrs. Jini Sunil	Shri K.J. Polytechnic, Bharuch	jinivt@rediffmail.com