

**GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)****Competency-focused Outcome-based Green Curriculum-2021 (COGC-2021)**

Semester-V

**Course Title: Civil Engineering Project-I**

(Course Code: 4350603)

| <b>Diploma Programme in which this course is offered</b> | <b>Semester in which offered</b> |
|--|----------------------------------|
| Civil Engineering  | 5 <sup>th</sup> Semester         |

**1. RATIONALE**

In order to help the students development, live project challenges should be offered to them as often as possible. For the students to be able to use and apply engineering-based knowledge and skills to address real world challenges, they must have first-hand experience and confidence. The selected pursuits should be relevant to student's academic interests and of professional relevance to organizations in the industrial sphere. So as to participate and manage a large civil engineering projects in future.

The Project and Seminar are both combined with the goal of developing a specific set of communication skills (report preparation, survey report writing, lab experiment results writing, participating in group discussions, verbally defending the project in the form of Seminar, etc.).

**2. COMPETENCY**

The goal of this project is to enhance capabilities among the students for comprehensive analysis and practices in a systemic way to develop differenttypes of skills so that students are able to acquire following competencies:

1. Apply the theoretical and practical knowledge and abilities which have learned in disciplines and courses to a project that will work in a real-world working context, ideally one that is industrial
2. Describe the functioning of the industrial setting and its working practices.
3. Explain what entrepreneurship is and how to become an entrepreneur
4. Determine and compare the gap between the technical knowledge gained through the curriculum and the real industrial requirement and to make up for it by acquiring additional knowledge as needed
5. Field computing and gaining practical experience in the planning, designing and execution of civil engineering projects.

### 3. COURSE OUTCOMES

Upon successful completion of this course, students will be able to;

**CO.1** Apply principles of basic science and engineering fundamental in analysis, design and operation of civil engineering systems.

**CO.2** Assess societal needs and plan suitable infrastructure

**CO.3** Analyze and design components of civil engineering projects

**CO.4** Develop team spirit and inter-personal dynamics for effective execution and management of projects

**CO.5** Engage in lifelong learning and adapt to changing professional and societal needs

### 4. TEACHING AND EXAMINATION SCHEME

| Teaching Scheme<br>(In Hours) |   |   | Total Credits<br>(L+T/2+P/2) | Examination Scheme |   |                 |    | Total<br>Marks |
|-------------------------------|---|---|------------------------------|--------------------|---|-----------------|----|----------------|
| L                             | T | P |                              | Theory Marks       |   | Practical Marks |    |                |
|                               |   |   | C                            | E                  | M | I               | V  |                |
| 0                             | 0 | 4 | 2                            | 0                  | 0 | 50              | 50 | 100            |

**Legends:** L - Lecture; T – Tutorial, P – Practical, E – Theory External, M - Theory Internal, I – Practical External, V - Practical Internal.

### 5. COURSE DETAILS

The project is offered to the students of 5<sup>th</sup> and 6<sup>th</sup> semester in order to inculcate innovation and attitude to develop skills. A group of four to eight students (maximum of fifteen students) work as a team for major project work.

The project should be selected such that it could be completed within 5<sup>th</sup> and 6<sup>th</sup> semester.

Project work should be distributed in three phases

1. Shodh Yatra :- Project topics searching starts during 4<sup>th</sup> semester
2. Project proposal :- Submission of project proposal against department PRC at the commencement of 5<sup>th</sup> semester (Project Review Committee)
3. Submission of final project report :- Submission of final project report at the end of semester.

### GUIDELINE FOR THE PROJECT– I, FOR DIPLOMA ENGINEERING

**Each final year (Fifth and Sixth Semesters) Project will be a Major Project. It will be divided into two Semesters**

**Project – I: 5<sup>th</sup> Semester (Marks: 100), L:T:P – 0:0:4, Credits: 2**

- Out of 100 marks, 50 marks are to be given as Practical Internal as per scheme

suggested.

- The college, Through Internal Assessment, will assess the User Defined Problems (UDP)/Industry Defined Problems (IDP), submitted by students as per time limit prescribed by the university in the fifth semester.
- The remaining 50 marks are for the Practical External which shall be conducted by the GTU.
- Each defined project needs to be from Industry/Research organization/Govt. organization/ socio-technical issues and according to the need of time for solving real life problems.
- There should be one Project Review Committee(PRC) in consists of following members
  - Head of Department (HOD)
  - Faculty member from the department-Project In charge
  - Internal faculty/Industry resource person

## 6.PROJECT GUIDELINE FOR STUDENT:

- Project identification should be based on “Shodh-Yatra” carried out by the students, during 4<sup>th</sup> Semester. The “Shodh Yatra” should be completed by the end of the first week from the commencement of the fifth semester.
- Students may visit the syllabus on GTU website for getting guidelines for final year project provisional titles or areas.
- They may consult the faculties of their choice of Civil Engineering for getting more clarity.
- Problem definition for the project needs to be submitted by every student/group of students within prescribed time limit against PRC. There should be one presentation of project proposals against PRC.
- After approval student should assign to the project guide in the beginning of 5<sup>th</sup> semester and students may work on areas approved under the supervision of allotted supervisor.
- There are two project review presentation during the semester against PRC. One for finalizing project proposal and one at the mid of the semester. The suggestions given by PRC have to be incorporated before completing the project.
- They may have to show their progress periodically to their supervisor as per directions given by supervisor.
- The students may submit their final project report duly signed/approved by their supervisor to the department at the end of semester.
- Real time problems, Industry related problems, and environment friendly problems should be chosen as a final year project.
- **Identification of Topic:** The selection of topic is of crucial importance. It should be decided based on your understanding of the study, in the field and interest. The topic should be discussed with the project supervisor. It should be in harmony with your areas of interest and the specialization of the project supervisor.  
Environment friendly and having low or zero carbon emission projects will be given priority.
- Students are advised to select project supervisor who are active professionals in the relevant area of the selected topic.
- The internal assessment marks will be evaluated based on progressive evaluation and oral presentation by the internal supervisor

**7. PROJECT ALLOCATION POLICY:**

- Students may have to submit their project proposal/ research interest with proposed supervisor if they have consulted to PRC within a week from commencement of 5<sup>th</sup> semester.
- There should be one power point presentation against PRC.
- PRC will access the proposal received by the students group and then finalize their titles/research areas and allocate them supervisor.
- The groups of students have to work under guidance of their allocated supervisor.

**8. TYPES OF PROJECT:**

The types of project may include:

1. Field study (empirical study).
2. Statistical and case studies
3. Experimental investigation,
4. Computational work,
5. Data collection and its analysis,
6. Design oriented.
7. Comprehensive case study (problem formulation, analysis and recommendations),
8. Comparison of practices/ validation of theory/ method of testing, survey of quality Management practices

The project should be challenging but manageable within the resources and time available and it should be helpful to society.

**Some of suggested projects topics are given below:**

- Advance Construction Techniques
- Smart Materials
- Rehabilitation Techniques.
- Advanced Pavement Design
- Stability of High Rise Buildings.
- Water Resources Engineering
- Analysis for Seismic Retrofitting Of Buildings.
- Bridge Bearings & Stability
- Advanced Earthquake Resistant Techniques
- Advanced Pavement Design
- Use of Polymer Composites In Bridge Rehabilitation
- Formwork Types & Design
- Marine Pollution
- Rectification of Building Tilt
- Interlinking of Rivers
- Flexible Pavement
- Value Engineering In Construction.
- Intelligent Transport System

- Development of Remote Monitoring System For Civil Engineering
- Fly-Ash Concrete Pavement
- Eco- Friendly Housing
- Non-Destructive Testing Of Concrete
- Offshore Structures.
- E – Waste Disposal
- Advanced Construction Equipments
- Study of Un Burnt Bricks
- Interlinking of Rivers
- Effects of Truck Impacts on Bridge Piers.
- Analysis for Seismic Retrofitting of Buildings.
- Hydraulic & Hydrological impacts on Bridges.
- Performance Evaluation of Existing Bridges Under Vehicle Dynamic Effects
- Zero Energy Buildings.
- Bamboo as a Building Material.
- Rectification of Building Tilt.
- Silica Fume Concrete.
- Sewage Treatment Plant of Taluka Place.
- Ground Improvement Techniques.
- Improvement of Bearing Capacity of sandy Soil By Grouting.
- Rural Road Development.
- Cellular Light Weight Concrete.
- Improvement of Bearing Capacity of sandy Soil by Grouting.
- Flexural Performance of Fiber Reinforced Mortar with Low Fiber Content.
- E - Waste Disposal of District Head Quarter.
- Ground Improvement Techniques.
- Assessment of Cracks in R.C.C Building.
- High-Performance Smart Materials & Structures.

#### **9.ROLE OF PROJECT REVIEW COMMITTEE:**

- There should be one Project Review Committee(PRC),which consists of following members
  - Head of Department (HOD)
  - Faculty member from the department-Project In charge
  - Internal faculty/Industry resource person
- PRC will arrange two reviews for the project in semester
  - One review for finalizing project titles/proposals and allotment of supervisor for each group of students
  - One midterm review.
- The PRC will give suggestions for improving quality of each project.

#### **10.ROLE OF SUPERVISOR/GUIDE:**

- The supervisor will supervise/guide the group of students allotted to him throughout the

semester.

- He/she will assess the students individually as per stipulated assessment guidelines and keep record of it.
- Suggest resources to the students.
- Guide students on how to address issues on environmental and sustainability. Environment friendly and having low or zero carbon emission projects will be given priority.
- Motivate continuously students allotted to him for doing best projects.

#### 11.ASSESSMENT CRITERIA FOR EFFECTIVE EVALUATION OF THE PROJECT:

The Diploma 5<sup>th</sup> Semester students project-I will be evaluated as per the scheme suggested below.

50 Marks are for Progressive Assessment to be evaluated by Institute concern Faculty /Supervisor for the Part-I only based on following criteria.

| Sr. No.      | Description  | Marks     |
|--------------|--|-----------|
| 1            | Identification of problem and Framing of Problem Statement | 10%       |
| 2            | Problem Analysis   | 10%       |
| 3            | Feasibility of proposed solution                           | 10%       |
| 4            | Adherence to Action plan                                   | 10%       |
| 5            | Content appropriateness                                    | 10%       |
| 6            | Technical knowledge and awareness related to the project   | 15%       |
| 7            | Project Report   | 15%       |
| 8            | Presentation   | 10%       |
| 9            | Question-Answer Technique                                  | 10%       |
| <b>TOTAL</b> |  | <b>50</b> |

#### 12.PO-CO MAPPING:

|                  |   |
|------------------|---|
| <b>Semester:</b> | <b>Project-I (Course Code: 4350603)</b> |
| <b>V</b>         | <b>POs and PSOs</b>                     |

| Competency & Course Outcomes | PO:1<br>Basic & Discipline knowledge | PO:2<br>Problem Analysis | PO:3<br>Design/ development of solutions | PO:4<br>Engineering Tools, Experimentation & Testing | PO:5<br>Engineering practices for society, sustainability & environment | PO:6<br>Project Management | PO:7<br>Life-long learning | PSO:1 | PSO: 2 | PSO: 3 |
|------------------------------|--------------------------------------|--------------------------|--|--|---|----------------------------|----------------------------|-------|--------|--------|
| CO:1                         | 3                                    | 3                        | 3  | 3  | 3   | 3                          | 3                          | -     | -      | -      |
| CO:2                         | -                                    | 3                        | 3  | 2  | 3   | 2                          | -                          | -     | -      | -      |
| CO:3                         | 3                                    | 3                        | 3  | 3  | 2   | 2                          | 3                          | -     | -      | -      |
| CO:4                         | -                                    | -                        | -  | -  | 3   | 3                          | 3                          | -     | -      | -      |
| CO:5                         | -                                    | -                        | 3  | 3  | 3   |                            |                            | -     | -      | -      |

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

**Note:** These is suggested mapping, supervisor should change these mapping according to the type of project and assess accordingly.

### 13.SAMPLE EVALUATION RUBRICS:

#### Title and Feasibility (Problem Identification)

| Parameters   | Excellent   | Adequate   | Average  | Satisfactory   |
|--|---|--|--|--|
| Identification of problem & Framing of Problem Statement | Detailed and extensive explanation of the purpose and need of the project                                   | Good explanation of the purpose and need of the project  | Average explanation of the purpose and need of the project   | Moderate explanation of the purpose and need of the project  |
| Problem Analysis   | Complete explanation of the key concepts, strong descriptions of the technical requirements of the projects | Complete explanation of the key concepts, Insufficient description of the technical requirements of the projects | Complete explanation of the key concepts but little relevance to literature, Insufficient description of the technical requirements of | All key concepts are not explain and very little relevance to literature, Insufficient description of the technical requirements of the projects |

|                                  |   |  |  |   |
|----------------------------------|---|--|--|---|
|                                  |   |  | the projects   |   |
| Feasibility of proposed solution | Detailed and extensive explanation/ analysis of content   | Collects a great deal of information and good study of the content                                 | Collects a great deal of information and moderate study of the content   | Collects information and satisfactory study of the content  |
| Adherence to Action plan         | Strictly adhered to the Action Plan prepared in advance and achieved all the mile stones within specified time limit. | Adhered to the Action Plan prepared in advance and achieved all the mile stones within time limit. | Followed the Action Plan prepared in advance but delayed in achieving one or two of them but ultimately completed the project within time limit. | Carried out the activities randomly without following the Action Plan but ultimately completed the project within time limit. |

### Abstract and Depth of Knowledge/Analysis & Result / Implementation & Execution

| Parameters   | Excellent  | Adequate  | Average  | Satisfactory  |
|--|--|---|--|---|
| Content appropriateness                                  | Appropriate Content and also presented in a logical sequence | Content is moderately relevant, but presented in a logical sequence | Content is moderately relevant, but presented randomly without logical concern | Presented content was partially relevant and also not in logical concern. |
| Technical knowledge and awareness related to the project | Extensive knowledge related to the project                   | Adequate knowledge related to the project                           | Average knowledge related to the project                                       | Lacks sufficient knowledge  |

|                |   |   |   |   |
|----------------|---|---|---|---|
| Project Report | Project report is according to specified format, reference included | Project report is according to specified format, but reference not included | Project report is partially as per specified format | Project report is not as per specified format |
|----------------|---|---|---|---|

### Presentation and viva

| Parameters                | Excellent  | Adequate   | Average   | Satisfactory  |
|---------------------------|--|--|---|---|
| Presentation              | Presentations are appropriate and well delivered, Proper eye contact with audience and clear voice with good spoken language | Presentations are appropriate and well delivered, clear voice with good spoken language but less eye contact with audience | Presentations are appropriate but not well delivered, eye contact with few audience and unclear voice | Content of Presentations are not appropriate, eye contact with few audience and unclear voice |
| Question-Answer Technique | Answered all the questions satisfactorily.   | Answered some questions satisfactorily.  | Answered 1 or 2 questions satisfactorily.   | Unable to answer the questions satisfactorily.  |

## 14. ARRANGEMENT OF CONTENTS IN PROJECT REPORT:

The sequence in which the project report material should be arranged as follows:

- 1) Cover Page
- 2) Title Page
- 3) Certificate
- 4) Abstract
- 5) Table of Contents
- 6) List of Tables
- 7) List of Figures
- 8) List of Abbreviations and Nomenclature
- 9) Chapters
  - i. Introduction
  - ii. Exhaustive Literature Survey/Review of Literature
  - iii. Define the problem.

- iv. Body of project (Developing the main theme of the present investigation project work)
  - v. Analysis/Results and Discussions
  - vi. Conclusions
  - vii. Future Enhancements / Recommendations
- 10) References
  - 11) Appendices

Each chapter should be given an appropriate title. Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited. Footnotes should be used sparingly. They should be typed single space and placed directly underneath in the very same page, which refers to the material they annotate.

#### **ARRANGEMENT OF PARAGRAPH IN A CHAPTER:**

- Each paragraph in a chapter should be properly numbered for example, 1.1, 1.2 etc., where first digit represents the Chapter Number and second digit the paragraph number. There is no need to indicate the number for the first paragraph in a chapter.
- Sub-paragraphs, if any indicated as 1.1.1, 1.1.2 etc. i.e. first digit representing the chapter, the second representing the paragraph and third representing the sub-paragraph.
- **Don't underline the headings or subheadings or side heading.** Instead use the bold letters.

#### **APPENDICES:**

- Appendix showing the detailed data, design calculations, derivation etc
- Appendices are provided to give supplementary information, which is included in the main text may serve as a distraction and cloud the central theme.
- Appendices should be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2, etc. Appendices, Tables and References appearing in appendices should be numbered and referred to as appropriate places just as in the case of chapters.
- Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.

#### **LIST OF REFERENCES:**

- References should be numbered from 1<sup>st</sup> chapter to the last chapter in ascending order and should be shown in square brackets.
- The bibliography list should be made strictly in alphabetical order of the name of the authors.
- The listing of references should be typed 4 spaces below the heading
- **References** in alphabetical order in single spacing left – justified.
- The reference material should be listed in the alphabetical order of the first author.
- The name of the author/authors should be immediately followed by the year and other details.

- A typical illustrative list given below relates to the citation example quoted above.

[Chapter] Author Name, „Title of the book or paper“, Publisher name, (year), Page No

#### References:

1. [1] Aripnammal, S. and Natarajan, S. ‘Transport Phenomena of SmSel – X Asx’, Pramana (1994) – Journal of Physics Vol.42, No.1, pp.421-425.

#### TABLE AND FIGURES:

- In the references by the word Table, is meant tabulated numerical data in the body of the project report as well as in the appendices.
- All other non-verbal materials used in the body of the project work and appendices such as charts, maps, photographs and diagrams may be considered as figures.

#### TYPING INSTRUCTIONS:

- The impression on the typed copies should be black in colour.
- The project report should be submitted in **A4** size (29 cm x 20 cm).
- Good quality or Bond paper should be used for the preparation of the project report.
- Typing should be done on one side of the paper with character font in **size 12 of Times New Roman**.
- 1.5 line spacing should be used for typing the general text.
- Subheading should be typed in bold Font size 12 and heading bold Font size 14.
- The layout should provide a margin of 1.50 Inches on the left, 1.00 Inches on the top, bottom and right.
- The page numbers should be indicated at the top-middle or bottom-middle of the each page.
- Headings should be in bold should not underline the heading/subheadings and should not put colons ( : ) in headings or subheadings.

#### **APPENDIX 1 (Cover page)**

(A typical Specimen of Cover Page )<Font Style Times New Roman Bold>

## **TITLE OF PROJECT REPORT**

<Font Size 18><1.5 line spacing>

### **A PROJECT REPORT**

<Font Size 14>

***Submitted by***  
<Font Size 14><Italic>

**NAME OF THE CANDIDATE(S)**  
<Font Size 16>

***In partial fulfilment for the award of the diploma of***

<Font Size 14><1.5 line spacing><Italic>

**DIPLOMA IN CIVIL ENGINEERING PROGRAMME**  
<Font Size 16>

**IN**  
DEPARTMENT OF CIVIL ENGINEERING  
Font size(14)  
logo

**NAME OF THE COLLEGE**  
<Font Size 14>

**GUJRAT TECHNOLOGICAL UNIVERSITY**  
<Font Size 16>  
<1.5 line spacing>

Year of submission: ( MONTH & YEAR)  
<Font Size 14>

**APPENDIX 2 (Title page)**

(A typical Specimen of Title Page) <Font Style Times New Roman – Bold>

A  
Project  
Report on

**<TITLE OF THE PROJECT WORK>**

Submitted for partial fulfilment of the requirements for the  
award of the

**DIPLOMA IN CIVIL**

**ENGINEERING**

**DIPLOMA IN CIVIL ENGINEERING PROGRAMME**

**BY BATCH**

<Mr. / Ms. Name of the Student (Roll No.)>

<Mr. / Ms. Name of the Student (Roll No.)>

<Mr. / Ms. Name of the Student (Roll No.)>

<Mr. / Ms. Name of the Student (Roll No.)>

<Mr. / Ms. Name of the Student (Roll No.)>

Under the guidance of

<Name of the Staff with designation>

Civil Engineering Department

**Department of Civil Engineering**

<<NAME OF INSTITUTE>>

<<ADDRESS OF INSTITUTE>>

***APPENDIX 3 (Certificate)***

(A typical specimen of Bonafide Certificate)

<Font Style Times New Roman>

**COLLEGE NAME**

<Font Style Times New Roman – size -18>

### CERTIFICATE

<Font Style Times New Roman – size -16>

<Font Style Times New Roman – size -14>

It is certified that this project report “.....**TITLE OF THE PROJECT**... ..”  
is the bonafide work of “.....**NAME OF THE CANDIDATE**.....”  
who has carried out the project work under my supervision.

<<Signature of the Head of the Department>>

<<Signature of the Project Supervisor>>

*SIGNATURE*

*SIGNATURE*

<<Name>>

<<Name>>

**HEAD OF THE DEPARTMENT**

**PROJECT SUPERVISOR**

<<Academic Designation>>

<<Department>>

Department of Civil Engineering

<<Full address of the Dept & College >>  
>>

<<Full address of the Dept & College

External Examiner .....<<Signature, Name, Designation& Address>>.....

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## 8. COURSE CURRICULUM DEVELOPMENT COMMITTEE:

### GTU Resource Persons

| No. | Name and Designation                                     | Institute                              | Contact No. | Email ID                 |
|-----|--|--|-------------|--------------------------|
| 1   | Hiteshkumar T. Patel,<br>Lecturer in Civil Engineering   | K D Polytechnic,<br>Patan              | 8128699640  | htpatel20@gmail.com      |
| 2   | Devendrakumar N. Sheth,<br>Lecturer in Civil Engineering | Government<br>Polytechnic,<br>Palanpur | 9978441158  | devendra_civil@yahoo.com |
| 3   | Arvindkumar R. Patel,<br>Lecturer in Civil Engineering   | Government<br>Polytechnic,<br>Palanpur | 9998515817  | arvindpatel19@gmail.com  |

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