Established Under Gujarat Private Universities Act No. 9 of 2016

Syllabus for Bachelor of Technology

Civil Engineering

Subject Code: 01CI0101

Elements of Civil Engineering

Objective of the Course:

The main objective to give the course fundamentals of civil engineering is

- To familiar students with the Mother branch of Engineering and students will have a broad perspective to identify the oldest branch of engineering providing basic infrastructure for development of civilized society.
- With an understanding of principles associated with civil engineering the students will persuade different civil engineering works like buildings, transportation and water & Drainage systems which are an integral part of very engineering professional's life irrespective of the discipline.

Credits Earned: 4 Credits

Course Outcomes: After completion of this course, student will be able to

- Recognize importance of Civil engineering and its day to day applications.
- Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map
- Describe qualitative comparison between different materials and its selection
- Understand the water cycle its importance, water resources its consumptive use
- Able to create & interpret building planning and will be able to draw plan, section and elevation
- Acquaint with the various modes of transportation

Pre-requisite of course: NA.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA	CSE	Viva (V)	Term work (TW)	
3	0	2	4	50	30	20	25	25	150

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Detailed Syllabus:

Sr. No	Topic name	Hours
1	**Introduction to civil Engineering:**	**3**
	Scope of civil Engineering & Role of civil Engineer Unit conversion, common units used in practice of civil engineering	
2	**Elements of Surveying**	**17**
	Introduction: applications, fundamental principles and classification of surveying, classification of plans & maps **linear measurement:** methods, Instruments used in chain surveying, Selection of stations, Chaining, Ranging, Offsetting. **Angular Measurement:** Instruments used, Types of compass, Types of meridians and bearings, Measurement of bearings, computation of angles. Compass traversing and correction of bearings for local attraction. **Levelling:** Aims and applications, Definition of various terms, Instruments for levelling, Methods of levelling, Recording observations in level-book, Computing reduced levels by HI and rise & fall method, Definition of contour, Characteristics of contours of different terrains and application of contour maps. **Modern Surveying:** Measurement by Electronic devices, Introduction to GIS, GPS & RS	
3	**Building Materials**	**5**
	Introduction, properties & classifications of materials: Bricks/blocks, cement, lime, sand, aggregates, stone, ceramic, glass, concrete, Ferrous metals & Non ferrous metals, glass, timber and modern materials	
4	**Building planning and its components**	**6**
	Classification of buildings, Principles of planning Conceptual planning of Residential & Public building Building components & their functions, types of load on building	
5	**Transportation Engineering**	5
	Role of transportation in national development, Modes of transportation, types of roadways, intro to traffic engg, intro to Urban Transportation system	

7	**Water resources & Management**	**4**
	Hydrological cycle, types of water resources, water demand & water scarcity Water use and its conservation techniques, Storage structures, water conveyance	
8	**Next Generation Civil Engineering**	**2**
	Building automation, Green building, advanced materials, sky scrapers, civil engineering wonders in the world	2
	Total	**42.0**

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
30%	30%	10%	10%	10%	10%

Suggested experiment & Project Work:

1) Chain and Compass Survey Project.
2) Profile Leveling Survey Project.
3) Basics sign & conventional symbol drawing sheet
4) Building planning drawing sheet

Instructional Method and Pedagogy:

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
2. Lectures will be taken in class room with the use of multi-media presentations, black board – mix of both.
3. Attendance is compulsory in lectures and laboratory which carries a 5% component of the overall evaluation.

4. Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation.
5. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weightage of 5%.
6. Surprise tests/Quizzes will be conducted which carries 5% component of the overall evaluation.
7. The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. Minimum 8 experiments are planned based on the course content.

Text books :

1. Introduction to civil Engineering By Bhogayata, Shah & Vora – Tata McGraw hill

Reference Books:

1. Surveying Vol. I by B.C. Punamia

2. Building construction by B.C. Punamia

3. Building Material by S.C.Rangwala

4. Hydrology & Water resource engineering by S.K.Garg

5. Highway & Transportation engineering by Khanna & Justo

Reference Links/ e-material:

1 http://www.nptel.iitm.ac.in/courses.php?branch=Civil

2 http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT-ROORKEE/SURVEYING/home.htm

3 http://www.nptel.iitm.ac.in/video.php?courseId=1040

4 http://www.nptel.iitm.ac.in/video.php?courseId=1059

5 *https://greenbuildingsolutions.org/Main-Menu/…Materials…/New-Materials-Application…*

6 *http://www.constructionworld.in/*