Tutorial

3130607Building Construction Technology

SEMESTER: 3

CIVIL ENGINEERING DEPARTMENT

GOVERNMENT ENGINEERING COLLEGE - DAHOD

Academic Year: 2024-25

:: VISION STATEMENT OF THE INSTITUTE ::

To be a value-based engineering institute to disseminate globally acceptable educationand nurturing research, innovation and entrepreneurship.

:: MISSION STATEMENTS OF THE INSTITUTE ::

1. To provide quality education in the engineering disciplines through creative balance ofacademics and extracurricular programs.
2. To provide learning environment for innovation and entrepreneurship.
3. To disseminate ethical values, social values and sensitivity towardsenvironmental issues.

:: VISION STATEMENT OF THE CIVIL ENGINEERING DEPARTMENT::

To be a recognized department in the field of civil engineering education to produce professional civil engineers, innovators and entrepreneurs for the development of the society.

:: MISSION STATEMENTS OF THE CIVIL ENGINEERING DEPARTMENT ::

1. To provide quality education to civil engineering undergraduates through creative balance of academic, professional and extra-curricular activities.

2. To impart knowledge in the field of civil engineering for the development of infrastructure facilities with environmental concern for betterment of the society.

3. To contribute in the nation's development through innovative ideas in the field of civil engineering.

:: PROGRAM OUTCOMES (POs) ::

Program Outcomes (POs) as identified by National Board of Accreditation (NBA), India are the attributes that the students are expected to attain at the point of graduation. Following are the POs of B.E Civil Engineering program:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The Engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend

and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

:: PROGRAM SPECIFIC OUTCOMES (PSOs) ::

Program Specific Outcomes (PSOs) are what the graduates of a specific undergraduate engineering program should be able to do at the time of graduation.

Civil Engineering Graduates shall have

PSO 1: Ability to analyze, design and rehabilitate the infrastructural projects of civil engineering.

PSO 2: Ability to use advanced civil equipment, software, techniques and work seamlessly in teams.

PSO 3: Ability to apply gained knowledge to choose from the innovative career paths, to be an entrepreneur, and a zest for higher studies.

:: PROGRAMME EDUCATION OBJECTIVES (PEOs) ::

Program Educational Objectives (PEOs) describe the career and professional accomplishments that programs are preparing graduates to attain within a few years (3-5 years) of graduation.

Following are the PEOs of B.E Civil Engineering Program:

1. Establish themselves as civil engineering professionals in government, public and private sectors
2. Manage infrastructural and sanitary facilities
3. Solve real world problems environmental concerns to serve society
4. Adapt to changing trends in analysis and design of civil engineering structures.
5. To do testing, survey and planning of civil engineering structures using modern tools

:: COURSE OUTCOMES (COS) ::

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course. These relate to the skills, knowledge, and behavior that students acquire in their matriculation through the course.

PROGRAM NAME: B.E. CIVIL ENGINEERING		
COURSE NAME: Building Construction Technology		
SEMESTER: 3	**A.Y 2024-25**	**Weightage %**
3130607.1	Develop in- depth understanding about construction materials, building components, its construction process etc., and apply the knowledge to execute normal sized building construction project.	**25**
3130607.2	Recognize the associated entities involved in building construction process.	**20**
3130607.3	Identify the factors to be considered in planning and construction of buildings.	**25**
3130607.4	Understand the practices and techniques for Temporary/Special construction works.	**15**
3130607.5	Able to apply learning to further research in sustainable civil engineering materials, construction technology and construction management field.	**15**

DISTRIBUTION OF THEORY MARKS					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20%	25%	25%	10%	10%	10%

Legends: **R**: Remembrance; **U**: Understanding; **A**: Application;**N**: Analyze; **E**: Evaluate **C**: Create and above Levels (As per revised Bloom's Taxonomy)

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
4	0	2	5	70	30	30	20	150

ESE - END SEMESTER EXAMINATION, **PA** - PROGRESS ASSESSMENT, **ALA** - ACTIVE LEARNING ASSIGNMENTS, **OEP** - OPEN ENDED PROBLEM

:: LABORATORY / TUTORIAL PLANNING ::

COURSE NAME: 3130607 Building Construction Technology

Semester: 3 Division: A

Faculty Member: **B1**Prof. D.K.Oza(DKO) **B2**Prof.C.S.Modhia (CSM

Sr. No.	Content	Topic Name	Planning Date	Actual Date	Total Hours
1	Tutorial – 1				
2	Tutorial – 2				
3	Tutorial – 3				
4	Tutorial – 4				
5	Tutorial – 5				

:: REFERENCE BOOKS ::

1. Building construction by B.C.Punamia, Laxmi publication
2. Building construction by Sushil kumar, Standard publishers Distributors
3. Building construction and Material by Gurucharansingh, Rajsons publications
4. Building construction by S.C.Rangwala, Charotar publication
5. Building construction by P.C.VarghesePHI india

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

Certificate

This is to certify that Mr./Ms. _____ _____ Enrollment No. _____of B.E. Semester III Civil Engineering of this Institute (GTU Code: _____)has satisfactorily completed the Assignments / Tutorial work for the subject Building Construction Technology(3130607) for the academic year 2024-25.

Place: _____

Date: _____

Name and Sign of Faculty member **Head of the Department**

Course Outcomes (COs):

(1) Develop in depth understanding about construction materials, building components, its construction process or methods etc., and apply the knowledge to execute normal sized building construction project

(2) Recognize the associated entities involved in building construction process

(3) Identify the factors to be considered in planning and construction of buildings

(4) Understand the practices and techniques for Temporary/Special construction works

(5) Learn the basics of recent practices towards green building planning

Sr. No.	Objective(s) of Experiment	CO 1	CO 2	CO 3	CO 4	CO 5
1.	Foundations and Setting out of works	√	√	√		
2.	Masonry Construction	√	√			
3.	Plain and Reinforced concrete construction	√	√	√		
4.	Doors and Windows	√				
5.	Stairs and staircases	√				
6.	Floorings	√				
7.	Roofs and roof coverings	√				
8.	Temporary/Special works	√	√		√	
9.	Special Treatments	√				
10.	Green buildings	√		√		√

Industry Relevant Skills

The following industry relevant competencies are expected to be developed in the student by undertaking the practical work of this laboratory.

1. Understanding the terminologies of different components/parts of the building
2. Having basic knowledge of construction activities, functioning and problems associated with it

Guidelines for the Faculty members

1. Involve and monitor all the students for writing assignments in two hours of the practical slots.
2. Teacher is expected to motivate the students to visit the library and read the number of associated reference books for the assignments.
3. Teacher may provide additional knowledge and information to the students.
4. Teacher is expected to refer complete curriculum of the course.
5. Teacher may add on other questions in addition to the questions provided, wherever required.

Instructions for Students

1. Students are expected to decide the scope of each questions wisely by referring appropriate book/s
2. Students may use one sided blank or one sided graph paper (as per the instructions given by the faculty) for attending questions with sketches. The sketches may be planned on left side opposite to the theory part.
3. Neat pencil work are required for drawing of sketches.
4. Assignments are required to completed and get checked time to time as per the instructions

of the concerned faculty.

Index

(Progressive Assessment Sheet)

Sr. No.	Objective(s) of Assignments	Page No.	Date of performance	Date of submission	Assessment Marks	Sign. of Teacher with date	Remarks
1	Foundations and Setting out of works						
2	Masonry Construction						
3	Plain and Reinforced concrete construction						
4	Doors and Windows						
5	Stairs and staircases						
6	Floorings						
7	Roofs and roof coverings						
8	Temporary/Special works						
9	Special Treatments						
10	Green buildings						
Total							

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology 3130607

Tutorial A– Site visit CO-5

1. Prepare site visit report with your observations, Machinery, Drawing reading, Mateial new innovation etc.,

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology **3130607**

Tutorial No: 1

(a) Subsoil Exploration and shallow foundation

Date:

Relevant CO:

Objectives: (a)

(b)

(c)

1. Explain the purposes for which sub-soil exploration is done. How do you decide the depth of exploration? Mention the recommended depth of exploration for various types of foundations.
2. Explain following methods of site Exploration with neat sketch.
   (a) Test pits, (b) Probing, (c) Auger boring, (d) Wash boring, (e) Sub surface soundings
3. List various geophysical methods of soil exploration. Describe with neat sketches geophysical methods
4. What are the different factors on which choice of exploration method depends?
5. Explain different bearing capacity of soils. Describe in detail plate load test with neat sketches for estimating field bearing capacity of soil.
6. Explain various methods of improving safe bearing capacity of soils
7. What is foundation? Explain various objectives or functions served by foundations.

8 What are the essential requirements of good foundation?

9 What are the causes of failure of foundation? What remedial measures would you adopt?

10 Explain in detail with the help of sketches, following types of shallow foundations.
(1) Wall footing, (2) Column footing, (3) Combined footing

11 Explain with sketch Raft footing and grillage footing

12 Explain foundations on (1) black cotton soil, (2) Reclaimed soil or made up ground

13 Explain setting out work of foundation trenches with neat sketches.

14 Explain deep foundation. Describe the uses of pile foundation.

15 Classify and briefly explain with neat sketches different types of piles.

16 Describe in detail non load bearing piles.

17 Write short note on: (i) Selection of piles, (ii) pile cap and pile shoe, (iii) Pile boring methods, (iv) Causes of failure of piles.

18 Differentiate between pile foundation and pier foundation. How does pier foundation differ from caisson foundation?

19 Write short note on: (i) Floating of caisson, (ii) Sinking of caisson, (iii) Tilting of caisson, (iv) Shifting of caisson

20 Write short note on: (i) Cofferdam, (ii) Caissons, (iii) Types of caissons, (iv) Loads on caisson and design features

21 Write short note on: (i) construction material of caisson, (ii) cutting edges in caisson, (iii) Caisson diseases.

Suggested Reference:<to be provided by the faculty member>

References used by the students: (Sufficient space to be provided)

Rubric wise marks obtained:

Rubrics	**1**	**2**	**3**	**4**	**5**	**Total**
Marks						

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 02 MASONRY CONSTRUCTION CO-1& Co-2

BATCH 1, 2, 3

1. Define the following terms with figure
   (a) King closer (b) Queen closer (c) Frog (d) Jambs (e) Reveals (f) Throating (g) Coping (h) Quoin (i) springing points (j) centering.
2. What is bond in brick masonry? What is its significance? What are the rules for bonding?
3. Describe with neat sketch different types of rubble masonry.
4. Give a point wise comparison of brick and stone masonry.
5. Explain with sketches the details of cavity wall at the following locations: a) Foundation level, b) Parapet level c) At openings.
6. Classify the stone masonry and describe the ashlar masonry in detail with figures.
7. Differentiate between English bond and Flemish bond.
8. Explain the reinforced brick lintel with sketch.
9. Distinguish between lintel & and arch. Draw a neat sketch of an arch and showon it various technical terms used in its construction.
10. What is composite masonry? Write various types of it. Explain any one in detail.
11. Explain with sketch: a) R.C.C. Lintel b) Semicircular brick arch.
12. What is cavity wall? Write advantages of cavity walls. What precautions tobe taken during cavity wall construction?

13. Explain relieving arch and horse shoe arch. Discuss different causes of failures of arches.
14. Classify and explain various types of arches based on material and workmanship.

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 03 PLAIN AND REINFORCED CONCRETE CONSTRUCTIONCO-1,CO3

1. Explain the methods of mixing, placing, compacting and curing concrete.
2. What is importance of reinforcement in concrete? Describe the various typesof reinforcement used in reinforced concrete.
3. Describe the ingredients of reinforced cement concrete and explain the functionof each ingredient.
4. What are the functions of water in concrete mix? Describe the properties of water which are necessary to be used to get good concrete.
5. What is water- cement ratio? How it affects on strength and workability of concrete?

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 04DOORS AND WINDOWS CO 1

1. What factors should consider for selecting type, shape and size, location andnumber of windows?
2. Explain Venetian door and Collapsible steel door.
3. Enlist types of doors. Write size of doors of residential buildings.Sketch solidcore flush door.
4. Sketch casement window and label various components of window on it.
5. What are the points to be kept in view, while locating doors in a room? Explainwith sketches: (a) Revolving Door (2) Dormer window.
6. Discuss flush door and collapsible steel door in detail.
7. Write short note on (a) Paneled doors and Glazed doors (b) Skylight windowand Lantern light widows

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 05STAIRS AND STAIRCASES CO-1,

1. Write short note on Escalator with sketch.
2. Explain with the help of sketches the following terms: (i) winders (ii) nosing(iii) landing
3. State and explain the circumstances under which the following types of stairs canbe provided : (i) half turn geometrical stair (ii) dog-legged stair iii) Open WellStair
4. Explain with sketches the following type of stairs.
5. a) Open Well Stair b) Half & Quarter turn stairs c) Bifurcated Stairs d) SpiralStairs e) Dog legged stair
6. Draw single flight staircase and label various components of stair on it. Alsosketch various types of steps with their names.
7. State requirements of a good stair case in brief and explain continuous stairs.

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 06 FLOORING CO-1, CO-3

1. Explain essential requirements of floor and describe tiled flooring.
2. Explain with the help of sketch the method of constructing timber flooring.
3. Explain in brief the factors that affect the selection of a floor finish.
4. Describe the following with neat sketches & mention the situations under which they are used. a) Reinforced brick flooring b) Ribbed Floor
5. Explain cement concrete flooring with advantages and disadvantages of it.
6. Enumerate various types of materials used for construction of floor base andflooring. Explain factors that affect the selection of flooring materials.
7. Draw a neat sketch of jack arch floor of bricks. Explain its method of construction.
8. Classify different types of timber floors and explain each in brief with help of sketches.

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 07 ROOF AND ROOF COVERING CO-1

1. What are the essential requirements of a good roof? Compare merits & demeritsof flat & pitched roof
2. Define the following terms in relation to roof.
   (1)Span (2) Rise of a roof (3) Ridge (4) Eaves (5) Gable (6) Purlins (7) Common rafter
3. Explain the factors affecting the selection of types of roof covering.
4. Enlist various materials used in roof covering.
5. Compare Steel roof trusses and Timber roof trusses.
6. What are the various types of flat terraced roofing? Explain lime concreteterracing with tile.

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 08 WALL FINISHES CO-1

1. What is difference between plastering and pointing?
2. Explain various types of pointing with sketches.
3. What are the basic characteristics of an ideal paint?
4. What are the objects of plastering? Describe in brief: (i) Cement Plastering(ii) Acoustical Plaster.
5. Define mortar. Describe lime mortar and cement mortar used for plastering.

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 09 TEMPORARY WORKS CO-4

1. What does it mean by shoring? Enlist the types of shores and describe in brief any one.
2. Explain Pit method for the under-pinning.
3. What do you understand by under-pinning? When do you require it? Explainwith sketches its method.
4. Write a note on needle scaffolding and dead shores.
5. What is meant by scaffolding? Discuss the essential requirements of it.

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology3130607

Tutorial 10 SPECIAL TREATMENT CO-4

1. Explain anti – termite treatment with details.
2. Briefly explain: (i) Thermal Insulation of exposed walls, (ii) Post-construction antitermite treatment.
3. Describe damp proofing treatment for the following (a) Foundation (b) Floor (c) Parapet.
4. What is sound insulation? What are the various effective measures adopted to achieve sound insulation in a building.
5. State the general principles that should be observed for providing dampproofing (DPC)
6. Discus in brief various types of thermal insulating materials.
7. Explain common acoustical defects and suggest remedial measures.
8. Describe common acoustical defects in auditorium and write recommended remedies.
9. Explain fire resisting properties of common building materials.

GOVERNMENT ENGINEERING COLLEGE, DAHOD

CIVIL ENGINEERING DEPARTMENT

BE-III 3th SEMESTER

Building Construction Technology 3130607

Tutorial 11 CO-5

1. Describe the new invention in Building Construction with case study.
2. What are the further research is available in sustainable civil engineering materials
3. What is new construction technology which would be not implemented in India?
4. How the construction management branchis useful to society.