



# GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING (Autonomous)

Approved by AICTE, New Delhi and Affiliated to JNTU-Kakinada

Re-accredited by NAAC with "A" Grade with a CGPA of 3.47/4.00

Madhurawada, Visakhapatnam - 530 048.

## DEPARTMENT OF CIVIL ENGINEERING

### SCHEME OF COURSE WORK

#### Course Details:

Course Title	<b>BUILDING MATERIALS AND CONCRETE TECHNOLOGY</b>
Course Code	<b>20CE1106</b>
L T P C	<b>3 0 0 3</b>
Program	<b>B.Tech.</b>
Specialization	<b>CIVIL ENGINEERING</b>
Semester	<b>III</b>
Prerequisites	<b>Surveying and Geomatics, Building materials and construction.</b>
Courses to which it is a prerequisite	<b>Project Management lab</b>

#### COURSE OUTCOMES (COs):

After completion of this course the student would be able to

CO	Course Outcomes	Learning Outcomes
1	Distinguish various types of bricks & stones used in construction.	1. Discuss Properties and Classification of bricks and stones 2. Explain types of bonds in brick masonry 3. Distinguish characteristics and classification of stone masonry
2	Explain different components & systems of buildings.	1. List out types of Lintels, Arches and Staircases 2. Discuss different types of flooring 3. Explain different types of roof
3	Infer the concept of water proofing, damp proofing materials and construction techniques.	1. Explain Damp Proofing in buildings 2. list out wall Finishing works like Plastering and Painting 3. Discuss Form work and Scaffolding in building construction
4	Identify the characteristics of basic ingredients and properties of concrete.	1. List out Classification of cement Fine and Coarse aggregates 2. Distinguish different properties of Fine and Coarse aggregates 3. Discuss different properties of Cement
5	Distinguish the properties of fresh and hardened concrete.	1. Explain workability of fresh concrete 2. Discuss Segregation and Bleeding which effect strength and stability of concrete 3. Distinguish different Properties of Hardened concrete.

#### PROGRAMME OUTCOMES

1. Graduates will be able to apply the knowledge of mathematics, science, engineering fundamentals to solve complex civil engineering problems.
2. Graduates will attain the capability to identify, formulate and analyse problems related to civil engineering and substantiate the conclusions

3. Graduates will be in a position to design solutions for civil engineering problems and design system components and processes that meet the specified needs with appropriate consideration to public health and safety.
4. Graduates will be able to perform analysis and interpretation of data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions.
5. Graduates will be able to select and apply appropriate techniques from the available resources and modern civil engineering and software tools, and will be able to predict and model complex engineering activities with an understanding of the practical limitations.
6. Graduates will be able to carry out their professional practice in civil engineering by appropriately considering and weighing the issues related to society and culture and the consequent responsibilities.
7. Graduates will be able to understand the impact of the professional engineering solutions on environmental safety and legal issues.
8. Graduates will transform into responsible citizens by resorting to professional ethics and norms of the engineering practice.
9. Graduates will be able to function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams.
10. Graduates will be able to communicate fluently on complex engineering activities with the engineering community and society, and will be able to prepare reports and make presentations effectively.
11. Graduates will be able to demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments.
12. Graduates will engage themselves in independent and life-long learning in the broadest context of technological change while continuing professional practice in their specialized areas of civil engineering.

**PROGRAMME SPECIFIC OUTCOMES(PSOs):**

1. Collect, process and analyse the data from topographic surveys, remote sensing, hydrogeological investigations, geotechnical explorations, and integrate the data for planning of civil engineering infrastructure.
2. Analyse and design of substructures and superstructure for buildings, bridges, irrigation structures and pavements.

3. Estimate, cost evaluation, execution and management of civil engineering projects.

**Course Outcome Vs Program Outcomes:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1		1		2						1	
CO2	1		2		1			1				
CO3	1		1		1						1	
CO4	2		2		1							
CO5	1		1		1							

**Course Outcome Vs Programme Specific Outcomes:**

CO	PSO1	PSO2	PSO3
CO1	1	1	1
CO2	1	1	
CO3	1		
CO4	1	1	1
CO5	1	1	

Mapping Levels:

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), put -: No Correlation

<b>Assessment Methods:</b>	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam
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**Teaching-Learning and Evaluation:**

Week	TOPIC / CONTENTS	CO	Sample questions	Teaching-learning strategy	Assessment Method & Schedule
1	<b>BRICKS &amp; STONES:</b> Properties of building stones –Classification of stones. Composition of good earth brick , Qualities of a good brick, Classification, Manufacturing of clay bricks, Comparison between clamp burning and kiln burning.	1	Discuss Properties and Classification of bricks and stones	Lecture/ Discussion	Assignment/ Quiz
2	<b>MASONRY:</b> Definition and terms used in masonry. Brick masonry, characteristics and requirements of good brick masonry, Bonds in brick work, Header, Stretcher, English, Flemish bond. Stone masonry – Classification of stone masonry – Random Rubble, Coursed Rubble and Ashlar	1	1. Explain types of bonds in brick masonry 2. Distinguish characteristics and classification of stone masonry	Lecture Problem solving	

	masonry.				
3	<b>UNIT-II:</b> Lintels, Arches and Vaults - Staircases – Types	2	List out types of Lintels, Arches and Staircases	Lecture Problem solving	
4	Different types of flooring-Concrete, Mosaic, Terrazo floors; Different types of roofs- Pitched, Flat and Curved Roofs	2	Discuss different types of flooring	Lecture Problem solving	
5	Lean-to Roof, Coupled Roofs, Trussed roofs	2	Explain different types of roof	Lecture	
6	King and Queen Post Trusses. Doors & Windows– Types, Sizes.	2	Explain truss	Lecture Problem solving	
7	<b>UNIT-III:</b> Damp Proofing and Water Proofing- Materials used	3	Explain Damp Proofing in buildings	Lecture Problem solving	
8	Specifications of Damp Proof Course in walls, Basic principles of water proofing of basements, Plastering	3	list out wall Finishing works like Plastering and Painting	Lecture Problem solving	
9	<b>MID-I</b>				
10	Pointing, White washing, Distempering and Painting	3		Lecture Problem solving	
11	Form work and Scaffolding	3	Discuss Form work and Scaffolding in building construction	Lecture Problem solving	
12	False ceiling, fire resisting materials.	3		Lecture Problem solving	
13	<b>UNIT-IV:</b> Chemical Composition, Chemical and Physical processes of Hydration, Structure of Hydrated Cement, Blended Cements	4	Discuss different properties of Cement	Lecture / Discussion	Assignment/ Quiz
14	Properties of cement and their effect on properties of Concrete. (Test procedures not required)	4	Distinguish different properties of Fine and Coarse aggregates	Lecture / Discussion/ Problem solving	
15	Classification, Mechanical, Physical and Thermal properties of Fine and Coarse aggregates that affect the properties of concrete. (Test procedures not required), Manufacturing Sand,	4	List out Classification of cement Fine and Coarse aggregates	Lecture/ Discussion	

	Quality of mixing water.				
16	<b>UNIT-V:</b> Definition, Factors affecting workability, significance, Tests available for measurement (test procedures not required)	5	Discuss Segregation and Bleeding which effect strength and stability of concrete	Lecture/ Discussion/ Problem solving	
17	Definitions – causes and effects, measurement – Laitance, Factors effecting performance o Hardened concrete, Water/ Cement Ratio, Abram’s law, Powers law, Gel space ratio, Maturity concept.	5	Distinguish different Properties of Hardened concrete.	Lecture / Discussion Problem solving	
<b>18</b>	<b>MID-II</b>				
<b>19</b>	<b>END EXAM</b>				