



INSTITUTE OF AERONAUTICAL ENGINEERING (AUTONOMOUS)

Dundigal, Hyderabad -500 043

CIVIL ENGINEERING

COURSE DESCRIPTION FORM

Course Title	Building materials , construction & planning			
Course Code	A40109			
Regulation	R13			
Course Structure	Lectures	Tutorials	Practicals	Credits
	4	-	-	4
Course Coordinator	Santosh Kamthane, assistant Professor, Civil Department			
Team of Instructors	Santosh Kamthane, assistant Professor, Civil Department			

I. COURSE OVERVIEW:

A construction materials course introduces students to materials used in different construction projects from building materials to ground and foundation make-up. Specific materials studied include soil, metals, concrete and wood. This course also covers finishes and materials for the exterior and interior of buildings. Skills are developed to assess the effect materials have on a building projects related to structure, fire safety, building codes as well as market demand.

A large part of construction management has to do with overseeing entire building projects or multiple construction projects. This course helps to develop students' skills in managing projects and people. This course may be taken at different times in a construction management program with an emphasis on residential or commercial construction.

Specific topics may include record keeping, job-site management, use of subcontractors and scheduling. Specific computer software may be used for construction project scheduling. Students typically work on sample projects in order to gain real-world experience in planning and scheduling construction projects.

II. PREREQUISITES:

Level	Credits	Periods / Week	Prerequisites
UG	4	5	

III. COURSE ASSESSMENT METHODS:

Session Marks	University End Exam Marks	Total Marks
<p>Mid Semester Test</p> <p>There shall be two midterm examinations.</p> <p>Each midterm examination consists of subjective type and objective type tests.</p> <p>The subjective test is for 10 marks of 60 minutes duration.</p> <p>Subjective test shall contain 4 questions; the student has to answer 2 questions, each carrying 5 marks.</p> <p>The objective type test is for 10 marks of 20 minutes duration. It consists of 10 Multiple choice and 10 objective type questions, the student has to answer all the questions and each carries half mark.</p> <p>First midterm examination shall be conducted for the first two and half units of syllabus and second midterm examination shall be conducted for the remaining portion.</p> <p>Assignment</p> <p>Five marks are earmarked for assignments.</p> <p>There shall be two assignments in every theory course. Marks shall be awarded considering the average of two assignments in each course.</p>	75	100

IV. EVALUATION SCHEME:

S. No	Component	Duration	Marks
1	I Mid Examination	90 minutes	20
2	I Assignment	-	5
3	II Mid Examination	90 minutes	20
4	II Assignment	-	5
5	External Examination	3 hours	75

V. COURSE OBJECTIVES:

To introduce students to the basic concepts which are used for construction purpose.

1. How the wood, cement, admixtures is used for buildings and construction process.
2. To develop the building walls and foundations and how they are useful for buildings.
3. In these mainly we know about building arches, roofs, doors, windows and ventilators and how they are given for buildings.
4. To develop the form work and finishing work which is used for buildings and to solve the defects of building properties which are able to know with material
5. Painting is also taken for a beautiful looking structure for the good manner.
6. These courses explain about the material which we want to use and how we want to use and how to give a good building for ma using purpose.

VI. COURSE OUTCOMES:

After completing this course the students will be able to:

1. Demonstrate the ability to know about different materials such as stones, bricks, Tiles, wood, aluminum, glass & paints and their classification, manufacture and structural requirements

2. Ability to know about the materials used in making of concrete such as cement and admixtures.
3. Ability to know about tests on cement such as field and lab tests and uses of cement and admixtures.
4. Graduates will demonstrate an understanding of various building components such as lintels, arches, types of roofs and joinery such as doors, windows and the materials used in making.
5. Graduates will demonstrate various building services such as plumbing services, sanitary and ventilations.
6. Graduates will demonstrate the various types of ventilations, air conditioning, types of air conditioning, fire protection and classification of fire hazards and fire resistant materials used in construction.
7. Graduates will demonstrate the types of masonry ,finishers and form work ,requirements ,standards
8. Graduates should be capable of self-education and clearly understand the value of building planning and principles of building planning, classification of buildings and building bye laws.
9. Graduates will be broadly educated and will have an understanding of the impact of building construction on society and demonstrate awareness of contemporary issues.
10. Graduates will be familiar in applying software methods to analyze civil engineering problems.

VII. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes		Level	Proficiency assessed by
PO1	An ability to apply knowledge of computing, mathematical foundations, algorithmic principles, and civil engineering theory in design of computer-based systems to real-world problems	H	Assignments, Tutorials, Exams
PO2	The ability to practice civil engineering using up-to- date techniques, skills, and tools as a result of life – long learning ability to design and conduct experiments, as well as to analyze and interpret data.	N	--
PO3	An ability to design , implement, and evaluate a field program to meet desired needs, within realistic constraints such as economic, environmental, social, political, health and safety, manufacturability, and sustainability.	H	Assignments, Tutorials, Exams
PO4	An ability to design a system or component to satisfy stated or code requirements of Civil Engineering	N	--
PO5	An ability to analyze a problem, identify, formulate and use the appropriate computing and Civil engineering requirements for obtaining its solution.	H	Assignments, Tutorials, Exams
PO6	An understanding of professional, ethical, legal, security and social issues and responsibilities.	N	--
PO7	An ability to communicate effectively, both in writing and orally	N	--
PO8	The broad education necessary to analyze the local and global impact of computing and engineering solutions on individuals, organizations, and society	N	--
PO9	Recognition of the need for, and an ability to engage in continuing professional development and life-long learning	N	--
PO10	Knowledge of contemporary issues as they affect the professional and ethical practice of engineering.	N	--
PO11	An ability to use current techniques, skills, and tools necessary for computing and engineering practice	H	Assignments and Tutorials, Exams
Po12	An ability to design and development principles in the construction of Civil Engineering of varying complexity.	N	--

PO13	An ability to recognize the importance of civil Engineering professional development by pursuing post graduate studies or face competitive examinations that offer challenging and rewarding careers in computing.	N	--
------	--	---	----

N - None

S - Supportive

H - Highly Related

VIII. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program specific outcomes		Level	Proficiency Assessed By
PSO 1	An ability to apply knowledge of computing, mathematical foundations, algorithmic principles, and civil engineering theory in design of computer-based systems to real-world problems	H	Lectures, Exercises and Assignments
PSO 2	An ability to design , implement, and evaluate a field program to meet desired needs, within realistic constraints such as economic, environmental, social, political, health and safety, manufacturability, and sustainability.	H	Project
PSO 3	An ability to use current techniques, skills, and tools necessary for computing and engineering practice	S	Guest lectures

N - None

S - Supportive

H - Highly Related

IX. SYLLABUS:

Unit –I:

STONES, BRICKS AND TILES: Building stones, Classification and quarrying –properties-structural requirements –dressing, Bricks- Composition of brick earth, manufacture and structural requirements.

WOOD, ALUMINUM, GLASS AND PAINTS: wood –structure –types and properties- seasoning –defects; alternate materials for wood –GI / fiber-reinforced glass bricks, steel & aluminum.

Unit –II:

CEMENT AND ADMIXTURES: WOOD: Ingredients of cement –manufacture –chemical composition – Hydration –field & lab tests, Admixtures –mineral &chemical admixtures-uses.

Unit –III:

BUILDING COMPONENTS: Lintels, Arches, and Vaults-stair cases-types of floors, types of roofs –flat, curved, trussed; foundations – types; Damp proof course; Joinery –doors –windows –materials – types.

BUILDING SERVICES: Plumbing services: water Distribution, Sanitary –Lines & Fittings; Ventilations: Functional requirements systems of ventilations. Air conditioning – essentials and types; Acoustics – characteristic absorption – Acoustic design; fire protection – Fire hazards – classification of fire resistant materials and constructions.

Unit –IV:

MASONRY AND FINISHING’S : Brick masonry – types –bonds ; stone masonry –types ; composite masonry –Brick-stone composite ;concrete , reinforced brick.

FINISHERS: Plastering, pointing, painting, cladding –types –tiles –ACP.

FORM WORK: Requirements- standards-scaffoldings –design; shoring, under pinning.

Unit –V:

BUILDING PLANNING: Principles of building planning, classification of buildings and building by laws.

TEXT BOOKS:

1. Building Materials and construction – Arora & Bindra, Dhanpat Roy Publications.
2. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain (2005), Building Construction, Laxmi Publications (P) ltd., New Delhi, India.
3. Building materials , construction and planning by S .MAHABOOB BASHA

REFERENCES:

1. Building materials by Duggal, New age Internations.
2. Building construction by PC verghese PHI.
3. Construction technology –vol -1 &2 by R. chuddy, Longman UK.
4. Basics of civil Engg by Subhash chander; Jain brothers.

X. COURSE PLAN:

The course plan is meant as a guideline. There may probably be changes.

Unit	Lecture Number	Topics Planned to cover	Learning Objectives
Course Content Delivery --- Lecture Wise Break-up of Topics			
I SPELL			
I	1&2	To understand about building stones and their relations in structures	STONES, BRICKS AND TILES:- Properties of building stones.
	3&4	To understand about types of stones	Classification of stones
	5-6	To understand how the quarrying is done and its precautions	Stone quarrying – structural requirements And dressing.
	7-9	To know about brick earth	Composition of brick earth, manufacture and structural requirements.
	10-11	To understand the quality of brick, To know about good tile	Qualities of a good brick, Characteristics of good tile
	12-14	To understand about the structure and properties of wood	WOOD , ALUMINUM ,GLASS AND PAINTS: Structure – properties – Seasoning of Wood , types of wood and defects
	15&16	To understand about the alternate materials for wood.	Use of Alternative materials for wood like , Galvanized Iron, Fiber-reinforced Glass bricks, steel & aluminum.
II	16-17	To understand about the cements and its properties	CEMENT & ADMIXTURES : Various types of cement and their Properties
	18-19	To know about the materials used in cements and concrete	Various ingredients of Cement Concrete and their importance, manufacture and chemical composition and hydration.
	20-21	To understand how the cement is used	Various field and laboratory tests for Cement
	22	To know about the admixtures and chemicals	Types of Admixtures-mineral & chemical & its uses
III	23-25	To know various building structural components	BUILDING COMPONENTS:- Lintels, Arches, and Vaults-stair cases – Types
	26-27	To know about the floors and different types used in buildings	Different types of floors-Concrete, Mosaic, Terrazzo floors
	28-29	To learn about roofs and types of roofs	pitched, flat and curved Roofs Lean-to-Roof, Coupled Roofs
	30	To understand about Joinery	Doors , windows and the materials used and types
II SPELL			
III	31-33	To know about various building services	BUILDING SERVICES :- Plumbing services: water distribution, sanitary – lines and fittings.
	34-36	To know about Ventilations used for buildings	Types of ventilations used for building and functional requirements and systems of ventilation.
	37-39	To know about air conditionings	Essentials of air conditioning and types of air conditioning
	40-41	To know about Acoustics	Characteristic absorption of acoustics and acoustic design.
	43-44	To know about fire protection	Fire hazards and classification of fire resistant materials used in construction

Unit	Lecture Number	Topics Planned to cover	Learning Objectives
IV	45-46	To know about masonry	MASONRY AND FINISHING'S :- masonry
	47-48	To know about brick masonry	Types and bonds used in brick masonry
	49-50	To know about stone masonry	Types of stone masonry
	51	To know about composite masonry	Brick –stone composite ,concrete and reinforced brick
	52-53	To know about finishers	Types of finishers :plastering , pointing , painting cladding s
	54-55	To know about tiles	Uses of tiles and ACP
	56-57	To know about form work	FORM WORK - Form work
	58-59	To know about the scaffolding	Scaffolding - standards and requirements
	60	To know how the Under Pinning is done in building works	Under Pinning
V	61-62	To know how planning is done	BUILDING PLANNING: planning
	63	To know about planning	Principles of planning
	64	To know about types of buildings	Classification of buildings
	65	To know about building laws	Building by laws

XI. MAPPING COURSE OBJECTIVES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

Course Objectives	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
I	H	H										S	H	S	
II	H	H	S										H	S	
III	H	H	S	S									S	H	
IV	H	S											H	S	
V		H			S								H		

S= Supportive

H = Highly Related

XII. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

Course Outcomes	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	H	S	S										H	S	
2	H			S									S	H	
3		H			S								H	S	
4	H	H											H		
5	H	S											S		
6	H											S	H	S	
7	S												S		
8	S	H											H	S	

9	S	H										S	H		
10	S	H										S	H		
11	S	H										S	H		
12	S	H										S	H		
13	S	H										S	H		

S= Supportive

H = Highly Related

Prepared by: - Santosh kamthane
(Assistant Professor)

HOD, CIVIL ENGINEERING