

CONSTRUCTION PROJECT MANAGEMENT

Course Code : CV561
L:P:T:S : 3:0:0:0
Exam Hours : 03
Hours/Week : 03

Credits : 3
CIE Marks : 50
SEE Marks : 50
Total hours : 40

Course Objectives

1. To understand the different components of project management
2. To understand design and construction process, effective use of labor & equipments and different costs involved in the project
3. To understand the rate analysis and cost involved in the project.

	Course Outcome
CO1	Determine the importance of planning an efficient project
CO2	Execute the project effectively by understanding the risks involved
CO3	Design cost effective project
CO4	Develop organization chart for the project
CO5	Justify the quality of project
CO6	Utilization of labour & equipments effectively (resources

Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	3								
CO2	3	1	2	3								
CO3	3	2	2	3								
CO4	1	3	2	2								
CO5	3	2	2	3								
CO6	2	3	1	3								

Unit	Content	Hours	Co's
1	THE OWNERS' PERSPECTIVE: Introduction - Project Life Cycle - Types of Construction - Selection of Professional Services - Construction Contractors - Financing of Constructed Facilities - Legal and Regulatory Requirements - Changing Environment of the Construction Industry - Role of Project Managers.	8	CO1, CO2 CO3
2	ORGANIZING FOR PROJECT MANAGEMENT: Project Management – modern trends - Strategic Planning - Effects of Project Risks on Organization - Organization of Project Participants - Traditional Designer-	8	CO2 CO3

	Constructor Sequence - Professional Construction Management - Owner-Builder Operation - Turnkey Operation - Leadership and Motivation for the Project Team.		
3	DESIGN AND CONSTRUCTION PROCESS: Design and Construction as an Integrated System - Innovation and Technological Feasibility - Innovation and Economic Feasibility - Design Methodology - Functional Design - Construction Site Environment	8	CO2 CO3 CO4
4	LABOUR, MATERIAL AND EQUIPMENT UTILIZATION: Historical Perspective - Labor Productivity - Factors Affecting Job-Site Productivity - Labor Relations in Construction - Problems in Collective Bargaining - Materials Management - Material Procurement and Delivery - Inventory Control - Tradeoffs of Costs in Materials Management. - Construction Equipment - Choice of Equipment and Standard Production Rates - Construction Processes Queues and Resource Bottlenecks	8	CO5
5	COST ESTIMATION: Costs Associated with Constructed Facilities - Approaches to Cost Estimation - Type of Construction Cost Estimates - Effects of Scale on Construction Cost - Unit Cost Method of Estimation - Methods for Allocation of Joint Costs - Historical Cost Data - Cost Indices - Applications of Cost Indices to Estimating - Estimate Based on Engineer's List of Quantities - Estimation of Operating Costs	8	CO6

NOTE: 1. Questions for CIE and SEE not to be set from self-study component.
2. Assignment Questions should be from self-study component only.

Self Study Component		
Unit	Contents of the unit	CO's
1	THE OWNERS' PERSPECTIVE: Study of PPP, significance of cost benefit ratio, CPM & PERT	CO1 CO2, CO3
2	ORGANIZING FOR PROJECT MANAGEMENT: Lump sum rate analysis	CO2 CO3
3	DESIGN AND CONSTRUCTION PROCESS: Labor charges as per SR books	CO2 CO3 CO4
4	LABOUR, MATERIAL AND EQUIPMENT UTILIZATION: Design rates for irrigation projects	CO5
5	COST ESTIMATION: Rate analysis of 2 storey, 2 BHK building	CO6

Text Books:

1. Chris Hendrickson and Tung Au, Project Management for Construction – Fundamental Concepts for Owners, Engineers, Architects and Builders, Prentice Hall, Pittsburgh, 2000.
2. Frederick E. Gould, Construction Project Management, Wentworth Institute of Technology, Vary E. Joyce, Massachusetts Institute of Technology, 2000.

References:

1. Chitkara, K.K. Construction Project Management: Planning, Scheduling and Control, Tata McGraw-Hill Publishing Company, New Delhi, 1998.
2. George J.Ritz , Total Construction Project Management - McGraw-Hill Inc, 1994.
3. ChoudhuryS , Project Management, McGraw-Hill Publishing Company, New Delhi, 1988.

Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	30	10	05	05
Remembrance	10	2	1	1
Understand	5	2	1	1
Apply	5	2	1	1
Analyze	5	2	1	1
Evaluate	5	2	1	1
Create				

*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – Sem End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	

ALTERNATE BUILDING MATERIALS

Course Code : CV562
L:P:T:S : 3:0:0:0
Exam Hours : 03
Hours/Week : 03

Credits : 3
CIE Marks : 50
SEE Marks : 50
Total hours : 40

Course Objectives

1. To understand the environmental issues concerned with building materials
2. To study the manufacture of various alternate building blocks
3. To study different composite materials and alternate building technologies.

	Course Outcome
CO1	Understand the environmental issues concerned with building materials
CO2	Characterize various building blocks
CO3	Interpret the properties and applications of various composite materials
CO4	Evaluate the properties and preparation of alternate building technologies
CO5	Design masonry compression elements
CO6	Analyze compressive strength of structural masonry

Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	3								
CO2	1	3	2	2								
CO3	2	2	3	3								
CO4	1	3	3	2								
CO5	2	3	2	3								
CO6	2	3	1	3								

Unit	Content	Hours	Co's
1	INTRODUCTION:Energy in building materials, Environmental issues concerned to building materials, Global warming and construction industry, Environmental friendly and cost effective building technologies. Requirements for building of different climatic regions, Traditional building methods and vernacular architecture.Siting and orientation of the building, Use of natural light, Solar heat and Ventilation, Concept of embodied energy and calculation.	8	CO1 CO2 CO3
2	ALTERNATIVE BUILDING MATERIALS:Characteristics of building blocks for walls. Stones and Laterite blocks.Bricks and hollow clay blocks. Concrete blocks. Stabilized blocks: Mud Blocks, Steam Cured Blocks, Fal-G Block and Stone Masonry Block	8	CO2 CO3
3	ALTERNATE COMPOSITE MATERIALS:Lime-pozzolana cements-Raw materials, Manufacturing process, Properties and uses, Fibre reinforced concretes, Matrix materials, Fibers : metal and synthetic, Properties and applications, Fibre reinforced plastics, Matrix materials, Fibers : organic and synthetic, Properties and applications, Building materials from agro and industrial wastes, Types of agro wastes .Types of industrial and mine wastes.	8	CO2 CO3 CO4
4	ALTERNATIVE BUILDING TECHNOLOGIES -Alternative for wall construction, Construction method. Masonry mortars. Types, Preparation and Properties, Ferro cement and ferroconcrete building components, Materials and specifications, Properties, Construction methods, Applications, Alternative roofing systems, Filler slabs, Composite beam panel roofs, Masonry vaults and domes.	8	CO5
5	GLASS FACADE ENGINEERING : Glass as a building material & its Applications, Float glass manufacturing technology , Key Functional Requirements, Building Physics: Theory of electromagnetic radiation Factors defining performance & Selection of Glass: (VLT, SF, UV, SHGC),Value Addition: Optical Properties- Coating Technology, Need for Green Buildings: Energy efficient buildings , Energy codes, Green ratings & its Approaches: ECBC, IGBC, GRIHA, Human safety Compliances, Fire Resistant Glazing: Types & Applications, Understanding Acoustic Glazing: Principle & Applications,	8	CO6

NOTE: 1. Questions for CIE and SEE not to be set from self-study component.
2.Assignment Questions should be from self-study component only.

Self Study Component		
Unit	Contents of the unit	CO's
1	INTRODUCTION: Cost concepts in buildings, Cost Analysis	CO1 CO2,CO3
2	ALTERNATIVE BUILDING MATERIALS: Cost saving techniques	CO2 CO3
3	ALTERNATE COMPOSITE MATERIALS: Case studies using alternatives.	CO2,CO3 CO4
4	ALTERNATIVE BUILDING TECHNOLOGIES: Machines for manufacture of concrete	CO5
5	GLASS FACADE ENGINEERING: Interior Glazing: Types & Applications, Glass for segments- Hospitals, Green Homes, Airports, Offices, Educational institutions, Types of Glass	CO6

Text Books:

1. Alternative building methodologies for engineers and architects, K.S. Jagadish and B.V. Venkatarama Reddy, Indian Institute of Science, Bangalore.
2. Structural Masonry, Arnold W. Hendry.

Reference Books:

1. Proceedings of workshop on Alternative building material and technology, 19th to 20th December 2003 @ BVB College of Engineering. & Tech., Hubli.

Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	30	10	05	05
Remembrance	10	2	1	1
Understand	5	2	1	1
Apply	5	2	1	1
Analyze	5	2	1	1
Evaluate	5	2	1	1
Create				

*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – Sem End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	

SOLID WASTE MANAGEMENT

Course Code : CV563
L:P:T:S : 3:0:0:0
Exam Hours : 03
Hours/Week : 03

Credits : 3
CIE Marks : 50
SEE Marks : 50
Total hours : 40

Course Objectives

1. Reduce the volume of the solid waste stream through the implementation of waste reduction and recycling programs
2. Maintain balanced solid waste management system which benefits the community
3. To reduce the volume of the solid waste stream through the implementation of waste reduction and recycling programs

	Course Outcome
CO1	Analyse efficient and economical refuse collection, recycling and disposal services.
CO2	Determine integrated Solid Waste Management strategy
CO3	Evaluate the amount and toxicity of material entering the waste flow (minimization);
CO4	Explain the different types of composting
CO5	Evaluate the waste that cannot be used and recovery of resources
CO6	Analyse the different types of sanitary land filling techniques.

Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1										
CO2		3										
CO3	1	1	2									
CO4		1	1									
CO5	3	1	2									
CO6	1	1	3									

Unit	Content	Hours	Co's
1	INTRODUCTION: Definition,– scope and importance of solid waste management, functional elements of solid waste management. SOURCES: Classification and characteristics – municipal, commercial & industrial. Methods of quantification.	8	CO1 CO2
2	COLLECTION AND TRANSPORTATION: Systems of collection, collection equipment, garbage chutes, transfer stations – bailing and compacting, TREATMENT / PROCESSING TECHNIQUES: Components separation, volume reduction, size reduction, chemical reduction and biological processing problems.	8	CO2 CO3
3	DISPOSAL METHODS: Open dumping – selection of site, ocean disposal, feeding to hogs, incineration, pyrolysis, composting, sanitary land filling, merits and demerits, INCINERATION: Process – 3 T's, factors affecting incineration process, incinerators – types, prevention of air pollution, pyrolysis, design criteria for incineration.	8	CO2 CO3 CO4
4	COMPOSTING: Aerobic and anaerobic composting, factors affecting composting, Indore and Bangalore processes, mechanical and semi mechanical composting processes	8	CO5
5	SANITARY LAND FILLING: Different types, trench area, Ramp and pit method, site selection, basic steps involved, cell design, prevention of site pollution, leachate & gas collection and control methods, RECYCLE AND REUSE: Material and energy recovery operations,	8	CO6

NOTE: 1. Questions for CIE and SEE not to be set from self-study component.

2. Assignment Questions should be from self-study component only.

Self Study Component		
Unit	Contents of the unit	CO's
1	INTRODUCTION: Land Pollution	CO1,CO2
2	COLLECTION AND TRANSPORTATION: Route optimization techniques and problems	CO2,CO3
3	DISPOSAL METHODS: Biomedical wastes and disposal.	CO2,CO3,CO4
4	COMPOSTING: Vermi composting	CO5
5	SANITARY LAND FILLING: Geosynthetics fabrics in sanitary land-fills. Reuse in other industries, plastic wastes, environmental significance and reuse.	CO6

Text books:

1. Hand book on Solid Waste Disposal.: Pavoni J.L.
2. Environmental Engineering.: Peavy and Tchobanoglous

Reference:

1. Environmental Engineering – Vol II. : S.K. Garg
2. Biomedical waste handling rules – 2000.
3. Solid Waste Engineering by Vesilind.Pa Worrell &Reinhart.D. –2009, Cengage Learning India Private Limited, New Delhi.

Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	30	10	05	05
Remembrance	10	2	1	1
Understand	5	2	1	1
Apply	5	2	1	1
Analyze	5	2	1	1
Evaluate	5	2	1	1
Create				

*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – Sem End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	

STRUCTURAL MASONRY

Course Code : CV564

L:P:T:S : 3:0:0:0

Exam Hours : 03

Hours/Week : 03

Credits : 3

CIE Marks : 50

SEE Marks : 50

Total hours : 40

- Course Objectives**
1. Students are expected to understand the strength and elastic properties of masonry and its constituent materials and failure modes
 2. Students shall be introduced to design of load bearing masonry buildings

	Course Outcome
CO1	Determine the strength of the different masonry elements in buildings
CO2	Analyse the behaviour, properties of masonry structures
CO3	Evaluate the different materials used in masonry structures
CO4	Explain the behaviour of masonry stress under different loading/ stress conditions
CO5	Design the masonry structures
CO6	Explain the Concept for vertical and horizontal reinforcement

Mapping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	3									
CO2	2	3	1									
CO3	1	2	1									
CO4	1	3	2									
CO5	1	3	2									
CO6	2	3	2									

Unit	Content	Hours	Co's
1	Introduction, Masonry Units, Materials and Types: History of masonry Characteristics of Brick, stone, clay block, concrete block, stabilized mud block masonry units – strength, modulus of elasticity and water absorption.	8	CO1 CO2

2	Strength of Masonry in Compression: Behaviour of Masonry under compression, strength and elastic properties, influence of masonry unit and mortar characteristics, effect of masonry unit height on compressive strength, influence of masonry bonding patterns on strength, prediction of strength of masonry in Indian context, failure theories of masonry under compression	8	CO2 CO3
3	Flexural and shear bond, flexural strength and shear strength: Bond between masonry unit and mortar, tests for determining flexural and shear bond strengths, factors affecting bond strength, effect of bond strength on compressive strength, shear strength of masonry, test procedures for evaluating flexural and shear strength.	8	CO2 CO3 CO4
4	Design of load bearing masonry buildings: Permissible stresses, stress reduction and shape reduction factors, increase in permissible stresses for eccentric vertical and lateral loads, permissible tensile and shear stresses, Effective height of walls and columns, opening in walls, effective length, effective thickness, slenderness ratio, eccentricity, load dispersion, arching action, lintels. Wall carrying axial load, eccentric load with different eccentricity ratios, wall with openings, freestanding wall. Design of load bearing masonry for buildings up to 3 storey using BIS codal provisions.	8	CO5
5	Introduction to reinforced masonry: Concepts for vertical and horizontal reinforcement schemes for masonry, construction process, BIS codal provisions Masonry arches, domes and vaults: Components and classification of masonry arches, domes and vaults, historical buildings, construction procedure.	8	CO6

NOTE: 1. Questions for CIE and SEE not to be set from self-study component.

2. Assignment Questions should be from self-study component only.

Self Study Component		
Unit	Contents of the unit	CO's
1	Introduction, Masonry Units, Materials and Types: Masonry materials – Classification and properties of mortars, selection of mortars	CO1 CO2
2	Strength of Masonry in Compression: Effects of slenderness and eccentricity, effect of rate of absorption, effect of curing, effect of ageing, workmanship on compressive strength	CO2,CO3
3	Flexural and shear bond, flexural strength and shear strength: Orthotropic strength properties of masonry in flexure, introduction to autoclave aerated concrete block, failure of masonry structures subjected to earthquake	CO2,CO3, CO4
4	Design of load bearing masonry buildings: Design of load bearing masonry for buildings up to 8 storey using BIS codal provisions	CO5
5	Introduction to reinforced masonry: Design of Arches, domes and vaults	CO6

Text books:

1. Brick and Reinforced Brick Structures, Dayaratnam P, Oxford & IBH
2. Structural masonry, Hendry A W, Macmillan Education Ltd

Reference:

1. Design of Masonry structures, Sinha B P & Davis, S R E & FN Spon
2. Design of reinforced and pre-stressed masonry, Curtin, Thomas Telford
3. Structural Masonry, Sven Sahlin, Prentice Hall
4. IS 1905(1993), BIS New Delhi
5. SP 20 (S & T), BIS, New Delhi

Assessment Pattern:

CIE: Continuous Internal Evaluation Pattern for theory: (50 Marks)

Blooms Category	Tests	Assignments	AAT 1	AAT 2
Marks (out of 50)	30	10	05	05
Remembrance	10	2	1	1
Understand	5	2	1	1
Apply	5	2	1	1
Analyze	5	2	1	1
Evaluate	5	2	1	1
Create				

*AAT 1– Alternate Assessment Tool 1

AAT 2 - Alternate Assessment Tool 2

SEE – Sem End Examination Theory (50 Marks)

Blooms Category	Theory Marks (50)
Remembrance	10
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	