

15CE101	BASIC CIVIL ENGINEERING				L	T	P	C
	Total Contact Hours - 30				2	0	0	2
	Prerequisite							
	Nil							

PURPOSE

To get exposed to the glimpses of Civil Engineering topics that is essential for an Engineer.

INSTRUCTIONAL OBJECTIVES

1.	To know about different materials and their properties
2.	To know about engineering aspects related to buildings
3.	To know about importance of surveying and the transportation systems
4.	To get exposed to the rudiments of engineering related to dams, water supply, and sewage disposal

UNIT I- BUILDING MATERILAS

(6hours)

Introduction – Civil Engineering – Materials: Bricks – composition – classifications – properties –uses. Stone – classification of rocks – quarrying – dressing –properties –uses. Timber - properties –uses –ply wood. Cement – grades –types – properties – uses. Steel – types – mild steel – medium steel – hard steel – properties – uses – market forms. Concrete – grade designation – properties – uses.

UNIT II- MATERIAL PROPERTIES

(6hours)

Stress – strain – types – Hook's law – three moduli of elasticity – poissons ratio – relationship – factor of safety. Centroid - center of gravity – problems in symmetrical sections only (I, T and channel sections). Moment of inertia, parallel, perpendicular axis theorems and radius of gyration (definitions only).

UNIT III -BUILDING COMPONENTS

(6hours)

Building – selection of site – classification – components. Foundations –functions – classifications – bearing capacity. Flooring – requirements – selection – types – cement concrete marble – terrazzo floorings. Roof – types and requirements.

UNIT IV-SURVEYING AND TRANSPORTATION

(6hours)

Surveying – objectives – classification – principles of survey. Transportation – classification – cross section and components of road – classification of roads. Railway – cross section and components of permanent way –functions. Water way – docks and harbor – classifications – components. Bridge – components of bridge.

UNIT V- WATER SUPPLY AND SEWAGE DISPOSAL

(6hours)

Dams – purpose – selection of site – types –gravity dam (cross section only). Water supply – objective – quantity of water – sources – standards of drinking water – distribution system. Sewage – classification – technical terms – septic tank – components and functions.

TEXT BOOKS

1. Raju .K.V.B, Ravichandran .P.T, "*Basics of Civil Engineering*", Ayyappa Publications, Chennai, 2012.
2. Rangwala .S.C," *Engineering Material's*, Charotar Publishing House, Anand, 2012.

REFERENCES

1. Ramesh Babu, "*Civil Engineering*", VRB Publishers, Chennai, 2000.
2. National Building Code of India, Part V, "*Building Materials*", 2005
3. Surendra Singh, "*Building Materials*", Vikas Publishing Company, New Delhi, 1996.

15CE101 - BASIC CIVIL ENGINEERING												
Course designed by		Department of Civil Engineering										
1.	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		x				x						x
2.	Mapping of instructional objectives with student outcome	1-4				1-4						2-4
3.	Category	General (G)	Basic Sciences(B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)			
		--	--		X				--			
4.	Approval											

15CE102	ELEMENTS OF BUILDING MATERIAL SCIENCE				L	T	P	C
	Total Contact Hours - 30				2	0	0	2
	Prerequisite							
	Nil							
PURPOSE								
To develop knowledge of conventional and new materials of construction.								
INSTRUCTIONAL OBJECTIVES								
1.	To learn the manufacturing process, types, applications and testing procedures for materials used for load bearing purpose							
2.	To know about materials that is used for protection and functional purpose.							
3.	To impart knowledge about basis of recent paradigms, and new materials							

UNIT I- BASIC LOAD BEARING MATERIALS (6hours)

Conventional Materials: Stones: classification of rocks – quarrying – dressing – properties –uses of stones – tests for stones. Bricks: composition – manufacture – four operations – classification – qualities – uses – test for bricks. Timber: classification of trees – structure of tree – methods – wood product – uses.

UNIT II - ADVANCED LOAD BEARING MATERIALS (6hours)

Cement: Introduction – ingredients – manufacture – dry and wet process – types of cement – properties – uses – tests for cement. Mortar: functions – requirements – types – properties – uses – tests on mortar. Steel: introduction – types – properties – uses – market forms. Concrete: Ingredients – functions – w/c ratio – grades – admixtures – test on concrete – properties – uses. RCC: Characteristics – elements - advantages – disadvantages.

UNIT III- SPECIAL CONSTRUCTION MATERIALS (6hours)

Prestressed concrete – types – properties – uses – merits and demerits. Ferro cement – advantages – uses. Fibre reinforced concrete – types of fibres – steel fibres – SFRC – properties – applications. Lightweight concrete – types. High density concrete, High strength concrete – advantages – applications, High performance concrete – properties.

UNIT IV- NON LOAD BEARING MATERIALS (6hours)

Paints: Functions – constituents – characteristics – selection – types of paints – defects. Varnishes: Elements – properties – types. Distempers: composition – properties. Asbestos: Properties – uses – asbestos cements products. Glass: Constituents – composition – classification – properties – market form – uses. Plastic: constituents – classification – properties – uses.

UNIT V - RECENT CONSTRUCTION MATERIALS (6hours)

Reactive powder concrete – properties, Geopolymer concrete – advantages, Blended cement concrete – use of mineral admixtures – properties, Self health monitoring concrete, Bacterial concrete, Roller compacted concrete - uses, Self compacting concrete – properties – advantages, Ready mixed concrete – advantages.

TEXT BOOKS

1. Raju .K.V.B, Annadurai .R and PRavichandran.P.T, "*Construction Materials*", Ayyappaa Publications, Chennai, 2012.
2. Varghese.P.C, "*Building Materials*", Prentice Hall India,2005.

REFERENCES

1. Rangwala .S.C, "*Engineering Materials*", Charotor Publishing House, New Delhi, 2012.
2. Surendra Singh, "*Building Materials*", Vikas Publishing Company, New Delhi, 1996.
3. Arora and Bindra .S.P, Building Construction, "*Planning Techniques and Method of Construction*", Dhanpat Rai Sons, New Delhi, 1988.
4. Gurucharan Singh, "*Building Construction and Materials*", Standard Book House, Delhi, 1988.
5. Shetty .M.S, "*Concrete Technology*", S.Chand and Company, New Delhi, 2010.
6. "*Lecture Notes on Special Concretes, Special Concrete*," Department of Civil Engineering, SRM Engineering College, Kattankulathur 2007.

15CE102 - ELEMENTS OF BUILDING MATERIAL SCIENCE												
Course designed by		Department of Civil Engineering										
1.	Student outcome	a	b	c	d	e	f	g	h	i	j	k
		x				x						x
2.	Mapping of instructional objectives with student outcome	1,2,3				1,2,3						2, 3
3.	Category	General (G)		Basic Sciences(B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)		
		--		--		--				X		
4.	Broad area	Structural Engineering		Geotechnical Engineering		Water Resources Engineering				Geomatics Engineering		
		X		--		--				--		
5.	Approval											

15AR101	PRINCIPLES OF ARCHITECTURE					L	T	P	C
	Total contact hours - 30					2	0	0	2
	Prerequisite								
	Nil								
PURPOSE									
To instill a broad understanding about architecture in students of civil engineering									
INSTRUCTIONAL OBJECTIVES									
1.	To create awareness about design criteria, building bye laws, development control rules & zoning regulations. Introduction to the basic architectural principles & imparting knowledge about building								
2.	To introduce the basic architectural principles in functional planning								
3.	To impart knowledge about building services .								

UNIT I-PLANNING ASPECTS & REGULATIONS

(10 hours)

Building types & design criteria - Space standards for residential, commercial & institutional categories. Building bye laws applicable for approval by the local governing body. Development control rules for Chennai metropolitan area.

UNIT II-ARCHITECTURAL PRINCIPLES

(10 hours)

Introduction to architecture - elements of architecture - primary forms - organizing principles - proportion, scale, balance, symmetry, hierarchy, axis with building examples from historical & contemporary architecture.

UNIT III-BUILDING SERVICES

(10 hours)

Integration of services in buildings - water supply & plumbing layout for a residential building - elevators & escalators - planning & installation - basic components of the electrical system for a residence - typical electrical layout diagram. Lay out of external services -water supply- sewage disposal-electrical cabling.

TEXT BOOKS

- Francis .D.K Ching- "*Architecture: Form Space & Order*" Van Nastrand Reinhold, 1996.
- Vaidyanathan .G, Kulasekaran .I, Sathishkumar .G, "*Building planning & construction companion*", Edifice Institute of Building services publication, 2002.

REFERENCES

- Joseph De chiara & John Callendar – "*Time saver standards for building types*", III Edition - Mc Graw Hill, 1990.
- National Building Code, "*Bureau of Indian Standars*", New Delhi, 2005.

15AR101 PRINCIPLES OF ARCHITECTURE												
Course designed by		Department of Architecture										
1.	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		X				X			X			
2.	Mapping of instructional objectives with student outcome	1-3				1-3			1-3			
3.	Category	General (G)		Basic Sciences(B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)		
		--		--		--				X		
4.	Approval											