

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE204	CONSTRUCTION TECHNOLOGY	4-0-0-4	2016

Prerequisite : Nil

Course objectives:

1. To study details regarding properties and testing of building materials,
2. To study details regarding the construction of building components
3. To study properties of concrete and concrete mix design
4. To impart the basic concepts in functional requirements of building and building services.
5. To develop understanding about framed construction and building failures

Syllabus:

Construction Materials – Building stones – Timber -Mortar – Iron and Steel – Structural steel – Modern materials. Concrete–Admixtures –Making of concrete -Properties of concrete– mix proportioning

Building construction - foundations –Masonry – Lintels and arches –Floors and flooring – Roofs and roof coverings -Doors, windows and ventilators -Finishing works .Tall Buildings – steel and concrete frame –prefabricated construction – slip form construction. Vertical transportation – Stairs –Elevators – escalators –ramps.

Introduction to Cost-effective construction - Building failures –failures in RCC and Steel structures– Foundation failure

Course Outcomes:

1. Ability to describe Construction materials, their components and manufacturing process
2. To equip with the properties of concrete and different mix design methods
3. Ability to understand the details regarding the construction of building components
4. Analyse and apply learning of materials, structure, servicing and construction of masonry domestic buildings.
5. Define and describe the concepts and design criteria of tall framed and load bearing buildings.

Text books

1. Rangwala S C., Engineering Materials, Charotar Publishers
2. Punmia B. C, Building construction. Laxmi Publications

Reference Books

1. Gambhir M L, Concrete Technology, Tata McGrawHill.
2. Krishna Raju N, Design of Concrete Mixes, CBS publishers.
3. Neville A.M. and Brooks.J.J, Concrete Technology, Pearson Education.
4. G c Sahu & Joygopal Jena., Building Materials and construction, McGraw Hill Education
5. National Building Code.
6. Smith P & Julian W. Building services, Applied Science Pub.
7. Mcking T.M, Building Failures, Applied Science Pub.
8. Shetty M.S., Concrete Technology, S. Chand & company.
9. Arora and Bindra, Building construction, Dhanpath Rai and Sons.
10. Adler R, Vertical Transportation for Building, American Elsevier Pub.
11. Tall building systems & concepts, Monograph on planning and design of Tall building,

COURSE PLAN			
Module	Contents	Hours	Sem.Exam Marks %
I	<p>Construction Materials – Building stones – Classification of rocks – Quarrying of stones. Dressing – Properties and uses of common stones – Tests conducted on stones.</p> <p>Timber – Classification – seasoning -defects in Timber – decay– preservation – Manufacture, properties and uses of plywood, fibre board, particle board.</p> <p>Mortar – Types – Sand – properties – uses. Iron and Steel –Reinforcing steel – types – specifications. Structural steel – specifications</p> <p>Miscellaneous materials (only properties, classifications and their use in construction industry): Glass, Plastics, A.C. Sheets, Bitumen, Adhesives, Aluminium</p>	8	15
II	<p>Concrete – Aggregates – Mechanical & Physical properties and tests – Grading requirements – Water quality for concrete –</p> <p>Admixtures – types and uses – plasticizers – accelerators – retarders –water reducing agents</p> <p>Making of concrete - batching – mixing – types of mixers – transportation – placing – compacting – curing</p> <p>Properties of concrete – fresh concrete – workability – segregation and bleeding - factors affecting workability & strength – tests on workability – tests for strength of concrete in compression, tension & flexure</p> <p>Concrete quality control – statistical analysis of results – standard deviation –acceptance criteria – mix proportioning (B.I.S method) – nominal mixes.</p>	10	15
FIRST INTERNAL EXAMINATION			

III	Building construction - Preliminary considerations –Foundations - shallow and deep foundations – description of spread, grillage, raft and pile foundation. Masonry – Types of stone masonry – Bonds in brickwork – advantages and limitations of masonry construction - corbels, cornice and copings composite walls - cavity walls and partition walls – construction details and features – scaffoldings.	9	15
IV	Lintels and arches – types and construction details. Floors and flooring – different types of floors and floor coverings Roofs and roof coverings – different types of roofs – suitability – types and uses of roofing materials Doors, windows and ventilators – Types and construction details Finishing works – Plastering, pointing, white washing, colour washing, distempering, painting. Methods of providing DPC. Termite proofing	10	15
SECOND INTERNAL EXAMINATION			
V	Tall Buildings – Framed building – steel and concrete frame – structural systems –erection of steel work–concrete framed construction–formwork – construction and expansion. joints Introduction to prefabricated construction – slip form construction Vertical transportation –Stairs – types - layout and planning.- Elevators – types – terminology – passenger, service and goods elevators – handling capacity - arrangement and positioning of lifts – Escalators – features –use of ramps	9	20
VI	Introduction to Cost-effective construction - principles of filler slab and rat-trap bond masonry Building failures – General reasons – classification – Causes of failures in RCC and Steel structures Foundation failure – failures by alteration, improper maintenance, overloading – Fire, Wind and Earthquake.	9	20
END SEMESTER EXAMINATION			

QUESTION PAPER PATTERN (End semester exam) :

Maximum Marks :100

Exam Duration: 3 Hrs

The question paper shall have three parts.

Part A -Module I & II : Answer 2 questions out of 3 questions (15 marks each)

Part B - Module III & IV: Answer 2 questions out of 3 questions (15 marks each)

Part C - Module V & VI : Answer 2 questions out of 3 questions (20 marks each)

Note : 1.Each part should uniformly cover the two modules in that part.

2. Each question can have a maximum of 4 subdivisions (a,b,c,d), if needed.

