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

Prerequisite : Nil

Course objectives:

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

Syllabus:

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

Building construction - foundations -Introduction to Cost-effective construction –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.

- Building failures and Retrofitting–failures in RCC and Steel structures– Foundation failure-

Expected Outcomes:

The students will be able to

i. understand construction materials, their components and manufacturing process
ii. know the properties of concrete and different mix design methods
iii. understand the details regarding the construction of building components
iv. analyse and apply learning of materials, structure, servicing and construction of masonry domestic buildings.
v. define and describe the concepts and design criteria of tall framed and load bearing buildings.

Text books

1. Arora and Bindra, Building construction, Dhanpath Rai and Sons.
2. Punmia B. C, Building construction. Laxmi Publications
3. Rangwala S C., Engineering Materials, Charotar Publishers
4. Shetty M.S., Concrete Technology, S. Chand & company.

Reference Books

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

COURSE PLAN			
Module	**Contents**	**Hours**	**Sem. Exam Marks**
I	Properties of masonry materials – review of specifications; **Mortar** – Types – Sand – properties – uses. **Timber products**: properties and uses of plywood, fibre board, particle board. **Iron and Steel** –Reinforcing steel – types – specifications. **Structural steel** – specifications **Miscellaneous materials** (only properties, classifications and their use in construction industry): Glass, Plastics, A.C. Sheets, Bitumen, Adhesives, Aluminium	9	15%
II	**Concrete** – Aggregates – Mechanical & Physical properties and tests – Grading requirements – Water quality for concrete – **Admixtures** – types and uses – plasticizers – accelerators – retarders –water reducing agents **Making of concrete** - batching – mixing – types of mixers – transportation – placing – compacting – curing **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 **Concrete quality control** – statistical analysis of results – standard deviation –acceptance criteria – **mix proportioning** (B.I.S method) – nominal mixes.	9	15%
FIRST INTERNAL EXAMINATION			
III	**Building construction** - Preliminary considerations for shallow and deep foundations **Masonry** – Types of stone masonry – composite walls - cavity walls and partition walls -Construction details and features – scaffoldings **Introduction to Cost-effective construction** - principles of filler slab and rat-trap bond masonry	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	9	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	10	20%
VI	**Building failures –** General reasons – classification – Causes of failures in RCC and Steel structures, Failure due to Fire, Wind and Earthquakes. **Foundation failure** – failures by alteration, improper maintenance, overloading. Retrofitting of structural components - beams, columns and slabs	10	20%
END SEMESTER EXAMINATION			

QUESTION PAPER PATTERN (End semester examination):

Maximum Marks :100 **Exam Duration: 3 Hrs**

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

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

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

Note : 1. Each part should have at least one question from each module