| 1151CE207 (VTUR15) | CONCRETE TECHNOLOGY | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 2 | 4 |

**Course Category:** Integrated Course

## A. Preamble

This course explains about the materials used for various types of constructions, their behaviour and concreting methods.

## B. Prerequisites:

- Construction Materials

## C. Link to other Courses:

- Repair and Rehabilitation of Structures
- Modern Construction Materials

## D. Course Educational Objectives:

Students undergoing this course are expected to

- Gain knowledge about materials used for various types of constructions.
- Acquire knowledge about the cement mortar and concrete.
- Gain knowledge about Concreting Methods.
- Impart knowledge about the mix design of concrete.

## E. Course Outcome:

| CO Nos. | Course Outcomes | Level of learning domain (Based on revised Bloom's) |
|---|---|---|
| CO1 | Explain the properties and testing of cement and aggregates. | K2 |
| CO2 | Explain the properties of fresh and hardened concrete. | K2 |
| CO3 | Design the mix proportion using various methods. | K2 |
| CO4 | Explain the features of special concretes. | K3 |
| CO5 | Explain the different concreting methods. | K2 |

## F. Correlation of COs with POs

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | | | M | M | | | | | | | |
| CO2 | L | | | | | | | | H | | | |
| CO3 | | M | M | | | M | | M | | | | |
| CO4 | | M | | M | | M | | | | | | |
| CO5 | L | | | M | M | | | | | | | |

**G. Course Content:**

**UNIT I CONSTITUENT MATERIALS 9**

Cement-Different types-Chemical composition and Properties –Tests on cement-IS Specifications- Aggregates-Classification-Mechanical properties and tests as per BIS Grading requirements- Water- Quality of water for use in concrete.

**UNIT II FRESH AND HARDENED PROPERTIES OF CONCRETE 9**

Workability-Tests for workability of concrete- Segregation and Bleeding-Determination of Compressive and Flexural strength as per BIS – Properties of Hardened concrete

**UNIT III MIX DESIGN 9**

Principles of concrete mix design – Methods of concrete mix design – Mix design based on IS Method, ACI Method and BS Method – Statistical quality control – Sampling and acceptance criteria.

**UNIT IV SPECIAL CONCRETES 9**

Light weight concrete, Fly ash concrete, Fibre reinforced concrete, Sulphur impregnated concrete, Polymer Concrete – High performance concrete – High performance fiber reinforced concrete, Self-Compacting Concrete, Geo Polymer Concrete, Waste material based concrete – Ready mixed concrete.

**UNIT V CONCRETING METHODS 9**

Concrete – Methods of batching, mixing, transportation, placing and curing. Extreme weather concreting – Special concreting methods – Vacuum dewatered Concrete – Underwater Concrete.

**LIST OF EXPERIMENTS:**

1. Determination of Properties of Aggregate
    a) Crushing Strength
    b) Impact Strength
    c) Elongation and Flakiness Index
    d) Water Absorption
    e) Abrasion Test
    f) Specific Gravity.
    g) Sieve Analysis.
2. Determination of Properties of fresh concrete
    h) Slump Cone Test
    i) Vee – Bee Consistometer
    j) Flow Table Test
    k) Compaction Factor
3. Determination of Properties of Hardened Concrete
    a) Compression Test
    b) Tension Test

**TOTAL: 45+30 = 75 Periods**

## H. Learning Resources:

### a) TEXT BOOKS


1. Shetty M.S., Concrete Technology, S.Chand and Company Ltd. Delhi, 2008.
2. Santhakumar.A.R. Concrete Technology, Oxford Institute Press, 2018.


### b) REFERENCES


1. IS 10262:2009 Guidelines for Concrete Mix Proportioning, Bureau of Indian Standards, New Delhi.
2. IS 383:1970 – Specification for coarse and fine aggregates from natural sources for concrete, Bureau of Indian Standards, New Delhi.
3. IS 1199:1959 Methods of sampling and analysis of Concrete, Bureau of Indian Standards, New Delhi.
4. IS 456: 2000 Code of practice for plain and reinforced Concrete, Bureau of Indian Standards, New Delhi.
5. Gambhir.M.L., Concrete Technology, McGraw Hill Education, 2006.
6. Gupta.B.L., Amit Gupta, Concrete Technology, Jain Book Agency, 2010.
7. Neville, A.M., Properties of Concrete, Prentice Hall, 1995, London.