

## CONSTRUCTION METHODS AND EQUIPMENT

**Course Code: 15CE2111**

<b>L</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>0</b>	<b>3</b>

**Course Outcomes:** At the end of the course, the student will be able to:

**CO1:** Associate the knowledge of construction of sub structures and superstructures.

**CO2:** Analyse the techniques for Erection of Construction units.

**CO3:** Demonstrate basic knowledge about Construction equipment and machinery.

**CO4:** Discuss about hauling and conveying equipment.

**CO5:** Demonstrate the ability to identify and manage with respect to time and their motion with respect to their movements.

### UNIT- I

(10-Lectures)

**SUB STRUCTURE:** Digging and excavation of trenches–Drilling and blasting techniques, Pile driving techniques – sinking of wells.

**SUPER STRUCTURE:** Concrete and reinforced concrete works–form work – reinforcement – concreting – mechanized methods for erection of Buildings and installations. Cast-in-situ and pre-cast concrete. Concreting below ground level– under water concreting design of forms.

### UNIT- II

(10-Lectures)

#### **ERECTION OF CONSTRUCTION UNITS:**

Different types of scaffolding. Tunneling techniques. Pre-cast and prefabricated construction – need and advantages. Modular construction – I.S. recommendations for modular planning, standardization, mass production and transportation.

### UNIT- III

(10-Lectures)

#### **CONSTRUCTION EQUIPMENT AND MACHINERY:**

Earthmoving Equipment-Power shovels, Back hoe, Dragline, Clam shell; tunneling machine – types.

**EXCAVATING EQUIPMENT:** Scraper, Bulldozer.

**COMPACTING EQUIPMENT:**

Smooth wheel roller sheep-foot roller – Pneumatic typed rollers.

#### **UNIT- IV**

(10-Lectures)

**CONSTRUCTION EQUIPMENT:**

Hoisting equipment—such as hoist winch, hoisting chains, hooks and slings, various types of cranes –tower crane, mobile crane and derrick crane, performance and safety in operation.

**HAULING EQUIPMENT:** Transit mixers and dumpers.

**CONVEYING EQUIPMENT:**

Belt Conveyors, Screw conveyor, Bucket conveyor.

**CONCRETE PRODUCTION EQUIPMENT-**Concrete mixers, truck mixers, pneumatic concrete placer, concrete vibrators. Pile Driving Equipment - Tunneling and rock drilling equipment – Pumps and dewatering equipment.

#### **UNIT- V**

(10-Lectures)

**TIME AND MOTION STUDIES:** process charts—application of queuing or wait line models maintenance of construction equipment

**MANAGEMENT OF CONSTRUCTION EQUIPMENT:** Need for mechanization of construction – planning and financing construction plant and equipment – Owning and operating equipment versus hiring.

#### **TEXT BOOKS**

1. S.Seetharaman, “*Construction Engineering and Management*”, 4<sup>th</sup> Edition, Umesh publications, New Delhi, 1999.
2. Mahesh Varma, “*Construction Equipment and its Planning and Applications*”, 5<sup>th</sup> edition, Metropolitan Book Co. Publishers, 2005.

#### **REFERENCES:**

1. Sengupta and Guha, “*Construction Management and Planning*”, 2nd edition, TMH, 2002.
2. Rangwala, S.C., “*Construction of Structures and Management of*

- Works*”, 5th edition, Charotar publishers , 2005
2. Srivatsava, U.K., “*Construction Planning and Management*“, 1st edition, Galgotia Publications Pvt. Ltd., New Delhi, India, 1999.
  3. “*Construction Machinery and Equipment in India*”. (A compilation of articles Published in Civil Engineering and Construction Review) Published by Civil Engineering and Construction Review, New Delhi, 1991.
  4. Jay P.K. “*Hand Book of Construction Management*” 1st edition, Mamillan India Ltd., New Delhi, 1990.
  5. National Building Code, ISI, New Delhi, 2005.
  6. Ghalot P.S. and Dhir B.M., “*Construction Management*”, 2<sup>nd</sup> edition, Wiley-Eastern, 1999.
  7. Peurifoy, R.L., “*Construction Planning, Equipment and Methods*”, 2<sup>nd</sup> edition, 1996.