

CONSTRUCTION METHODS AND EQUIPMENT

Course Code: 13CE2111

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Course Outcomes:

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

- CO1 : Associate the knowledge of construction of substructures and superstructures.
- CO2 : Analyse the techniques of 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

SUBSTRUCTURE: Digging and excavation of trenches – Grading – Special earth work excavation – Drilling and blasting techniques. Pile driving techniques – sinking wells.

SUPERSTRUCTURE: Concrete and reinforced concrete works – forms work – reinforcement – concreting – mechanized methods of erection of Buildings and installations. Cast-in-situ and pre-cast concrete. Concreting below ground level, wall in situ method for cast in situ and precast concrete – under water concreting design of forms.

UNIT- II

ERECTION OF CONSTRUCTION UNITS: Different types of scaffolding. Erection of steel structures – Tunneling techniques. Pre cast and prefabricated construction – need and advantages. Modular co-ordination – I.S. recommendations for modular planning, standardization, mass production and methods of transportation.

UNIT- III

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

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

HAULING EQUIPMENT: Dump trucks and dumpers.

CONVEYING EQUIPMENT: Belt Conveyors, Screw conveyor, Bucket conveyor.

AGREEMENT AND 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

TIME AND MOTION STUDIES: process charts – application of queuing or wait line models management 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 – planning for infrastructure mechanization equipment management – equipment maintenance and repair.

TEXT BOOKS

1. S.Seetharaman, “*Construction Engineering and Management*”, 4th Edition , Umesh publications, New Delhi, 1999.
2. Mahesh varma, , “*Construction Equipment and its Planning and Applications*”, 5th 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
- 3.Srivatsava, U.K., “*Construction Planning and Management*”, 1st edition, Galgotia Publications Pvt. Ltd., New Delhi, India, 1999.
- 4.“*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.
- 5.Jay P.K. “*Hand Book of Construction Management*” 1st edition, – Mamillan India Ltd., New Delhi, 1990.
- 6.National Building Code, ISI, New Delhi, 2005.
- 7.Ghalot P.S. and Dhir B.M., “*Construction Management*”, 2nd edition, Wiley-Eastern, 1999.
8. Peurifoy, R.L., “*Construction Planning, Equipment and Methods*”, 2nd edition, 1996.
