

INSTITUTE	FACULTY OF TECHNOLOGY
PROGRAM	BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)
SEMESTER	5
COURSE TITLE	CONSTRUCTION EQUIPMENT AND AUTOMATION
COURSE CODE	01CI0514
COURSE CREDITS	3

Objective:

- 1 To make students understand about concepts of automation and their application in construction.
- 2 To impart knowledge with the various types of construction equipment, their applications, and how to select and operate them.
- 3 To understand the principles and applications of drones in the construction industry.
- 4 To make students understand about concepts of automation and their application in construction
- 5 To able to analyze construction projects and recommend appropriate equipment and automation solutions to improve project efficiency.

Course Outcomes: After completion of this course, student will be able to:

- 1 Select appropriate equipment for specific construction projects based on site Conditions and requirement.
- 2 Identify and describe the different types of construction equipment used in the Industry.
- 3 Discover the capabilities and limitations of drones in construction projects.
- 4 Recognize emerging trends and innovations in automation for construction.

Pre-requisite of course:..

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	25	25
Contents : Unit	Topics						Contact Hours
1	Introduction Distinctive characteristics of construction equipment, Necessity of construction equipment, Importance of equipment in construction projects, Trends and innovations in construction equipment						3

Contents : Unit	Topics	Contact Hours
2	Construction Equipment Excavating Equipment, Pavers, Rollers, plastering machines, Cranes and Hoists, Concrete Batching Plants, Hauling and conveying equipment , Capacity, Feasibility, Safety, owning and operating cost of Different Construction Equipment	14
3	Automation in Construction Industry Emerging Trends in Automation in Construction; Need, Challenges and Benefit of automation , Automated equipment and machinery for construction: Automation in Canal lining, Automation in Highway Construction, Automation in concrete technology	8
4	Drones and Robotics in Construction Drones: Photogrammetry, Project Monitoring- real time data, aerial mapping, land survey, quantity survey, quality survey, structural health monitoring survey, under water survey. , Robotics Applications: Brick laying, Demolition, Material Handling, Structural steel cutting, Rebar tying/bending, Form work production, 3D printing parts and objects of homes, buildings, bridges and roads	13
5	Introduction to Advanced Technologies Building Information Modeling (BIM), Virtual Reality (VR), Augmented Reality	4
Total Hours		42

Textbook :

- 1 Construction Project management, Theory & Practice, Kumar Neeraj Jha, Pearson Education India, 2008

References:

- 1 Construction Planning, Methods and Equipment, Construction Planning, Methods and Equipment, R.L Peurifoy, McGraw Hill, 2011

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
10.00	25.00	20.00	25.00	10.00	10.00

Instructional Method:

- 1 At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- 2 Lectures will be taken in class room with the use of multi-media presentations, black board – mix of both.
- 3 Attendance is compulsory in lectures and laboratory which carries a 5% component of the overall evaluation.
- 4 Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation
- 5 Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weightage of 5%.
- 6 Surprise tests/Quizzes will be conducted which carries 5% component of the overall evaluation.

Supplementary Resources:

- 1 https://onlinecourses.nptel.ac.in/noc21_ce21/preview