**Techno India NJR Institute of Technology**



**Course File**

Construction Technology and Equipment

 **(5CE3-01)**

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**Course Overview:**

 Student will learn basics of CTE from this 28-hour course. This course will introduce and train students in the basic skills necessary to pursue a career in construction. This course covers foundations, flooring, framing, plumbing, electrical, sheet rock, windows, doors, cabinetry, blueprint reading, use of hand tools, construction math and Proper use of appropriate equipment contributes to Economy, Quality, Safety, Speed and Timely completion of the Project. Upon completion of this course, students will have the opportunity to apply for summer work with several industry partners.

* CTE is the basic requirement for the job role as Civil Site Engineer in the companies like L &T, NCC Ltd. Etc. Most of the questions asked during the placement drive for the Construction Company are created from this subject. Student should learn and develop problem solving abilities.

**Course Outcomes:**

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| --- | --- | --- |
| **CO. NO.** | **Cognitive Level** | **Course Outcome**  |
| 1 | Analysis | Student will be able to Analyse the Construction accounting and Benefit-cost analysis, the Turnkey activities and Understanding the International finance. |
| 2 | Application | Student will be able to Apply the Classification of fire and Site planning and housekeeping and also Understand about the Safety in scaffolding, Road work and pilling operation |
| 3 | Synthesis | Students will be able to Plan the Project Management, and work of Project manager, organization structures, organizing and staffing the project office and team Understand the Management functions, Directing, controlling, project authority, interpersonal influences, barriers, team building, communication, time management, conflicts Understand and explain Construction Planning milestone schedules, WBS, Network Techniques, CPM, PERT and Prima Vera, Resources levelling and smoothing. Understand Cost Control, operating cycles, cost account codes, Job cost report, Projected Cost Estimates, status reporting, variance and earned value and Project Management System, MIS reporting, Daily, Weekly. |
| 4 | Application  | Students will be able choose the Standard types of Equipment, the Earthmoving Equipment, knowing working of the Earthmoving Equipment Pumping Equipment’s, Preparation of report on Different equipment types and their usage |
| 5 |  Synthesis  | Students will be Able to arrange Construction Resources, and will Plan about the Labour Management, Materials and Equipment Requirement the know about the Time Management, Resource Allocation and Levelling. |

**Prerequisites:**

1. Apply the construction practices and techniques.

2. Practice about the Construction Equipment and Management.

3. Examine the factors to be considered in planning and construction of buildings.

 4. Demonstrate safety measures involved in construction work

5. Choose the appropriate machinery for various construction works

**Course Outcome Mapping with Program Outcome:**



**Course Coverage Module Wise:**

|  |  |  |
| --- | --- | --- |
| Lecture No. | Unit |  Topic |
| 1 | **1** | **INTRODUCTION:** Objective, scope and outcome of the course |
| 2 | **2** | **INTRODUCTION ON ENGINEERING ECONOMY** |
| 3 | 2 | Student Should be able to write about Principle of Engineering Economy |
| 4 | 2 | Student Should be able to write about Minimum cost point analysis |
| 5 | 2 | Student Should be able to write about Breakeven point analysis |
| 6 | 2 | Student Should be able to write about Depreciation |
| 7 | 2 | Student Should be able to write about Depletion. / Depreciation & Depletion |
| 8 | **3** | **SAFETY IN CONSTRUCTION:** Causes, classification |
| 9 | 3 | Student Should be able to write about Cost and measurement of an accident, safety programmed for construction |
| 10 | 3 | Student Should be able to write about Safety in construction**: Protective** equipment, accident report, |
| 11 | 3 | Student Should be able to write about Safety measure: (a) For storage and handling of building materials |

|  |  |  |
| --- | --- | --- |
| 12 | 3 | Student Should be able to write about Safety measure: (b) Construction of elements of a building |
| 13 | 3 | Student Should be able to write about Safety measure: (c) In demolition of buildings |
| 14 | 3 | Student Should be able to write about Safety lacuna in Indian scenario |
| 15 | 3 | Fire safety provisions as per NBC |
| 16 | **4** | **CONSTRUCTION PLANNING:** Need of construction planning |
| 17 | 4 | Student Should be able to write about Constructional Resources, Construction team |
| 18 | 4 | Student Should be able to write about Stages in construction |
| 19 | 4 | Student Should be able to write about Preparation of construction schedule |
| 20 | 4 | Student Should be able to write about Job layout, inspection and quality control |
| 21 | 4 | Student Should be able to write about Materials Management: Objective of Material Management |
| 22 | **4** | Student Should be able to write about Materials Management: Functions of Material Management |
| 23 | 5 | Student Should be able to write about Introduction on Construction Equipment and Management |
| 24 | 5 | Earth Moving Equipment-Bull dozers |
| 25 | 5 | Student Should be able to write about Tractor pulled scrapers Power shovels Dragline’s clamshells; cranes; Hoes |
| 26 | **5** | **TRENCHING MACHINE TYPES HAULING EQUIPMENT**; Drilling |
| 27 | 5 | Student Should be able to write about Blasting and Tunnelling Equipment |
| 28 | 5 | Student Should be able to write about Pile Driving Equipment |

**TEXT/REFERENCE BOOKS**

1. Construction Planning, Equipment and Methods by Robert Peurifoy and Clifford J Schexnayder.
2. Construction Technology and Management by Gaurav K Sagar & Arvind K Sagar.
3. Modern Construction Equipment and Methods by Frank Harris.

**Course Level Problems (Test Items):**

|  |  |
| --- | --- |
| **CO.NO.** | **Problem description** |
| **1** | 1. Write a note on Principal of Engineering Economy
2. Write a note on Minimum Cost Point analysis
3. Write a short note Breakeven Point analysis
4. Write a note on Depreciation and Depletion
 |
| **2** | Write a note on Accident1. Write a note on causes of accident
2. Explain in detail about Protective equipment
3. Explain in detail the Demolition Process of Building
4. Write a note on Safety Masseurs at site
 |
| **3** | Explain detail about Job layout1. Write a note on Construction planning in detail
2. Explain in detail Quality Control at site
3. Explain in detail construction schedule
4. Write about Material Management
 |
| **4** | 1. Write about a note on Earth Moving Equipment.
2. Explain in detail Function of Scrapers.
3. Write a note on Hauling Equipment
4. Explain in detail the Function of Cranes
5. Write a note on Tunnelling Equipment
 |

**Assessment Methodology:**

1. Assignments one from each unit.
2. Midterm subjective paper where they have to write About Construction Technology and Equipment . (Twice during the semester)
3. Final paper at the end of the semester subjective.

**Teaching and Learning resources unit-wise:**

**Unit-1**

**Engineering Economy**

Principal Engineering Economy

Video Tutorials: <https://www.youtube.com/watch?v=yMlryT9LL8w>

Breck even analysis

Video Tutorials <https://www.youtube.com/watch?v=wOEkc3O_Q_Y>

Depreciation and depletion

Video Tutorials <https://www.youtube.com/watch?v=SjLzJ1WkOE0>

Theory concepts: <https://www.investopedia.com/terms/d/depreciation-depletion-and-amortization.asp>

<https://cleartax.in/s/break-even-analysis>

<https://www.hzu.edu.in/engineering/engineering%20economy.pdf>

Sample Quiz: <https://engineeringinterviewquestions.com/engineering-economics-multiple-choice-questions-answers/>

**Unit-2**

**Safety in Construction**

Video Tutorials: <https://www.youtube.com/watch?v=GuqMJy_e3U4>

<https://www.youtube.com/watch?v=ZdeetmkhpKs>

Theory concepts: <https://www.labour.gov.hk/eng/public/os/D/ConstrutionSite.pdf>

 <https://core.ac.uk/download/pdf/287324325.pdf>

Sample Quiz: <https://play.howstuffworks.com/quiz/the-construction-safety-quiz>

**Unit-3**

**Construction planning**

Video Tutorials: <https://www.youtube.com/watch?v=Jgg03Pplheo>

Construction stage

<https://www.youtube.com/watch?v=pvJpXvjw_v8>

construction schedule

<https://www.youtube.com/watch?v=Nto1VbJSQWs>

Construction Quality Control

<https://www.youtube.com/watch?v=ypTiYyh7YT0>

Theory concepts: <http://raymushomes.com/DOWNLOADS/stages-of-construction.pdf>

<https://www.state.nj.us/transportation/eng/documents/scheduling/pdf/Scheduling_Manual_02-15-2002.pdf>

<http://www.cdb.gov.bt/uploads/downloads/1.%20Quality%20Assurance%20and%20Quality%20Control.pdf>

Sample Quiz:

<https://www.objectivebooks.com/2016/04/construction-planning-and-management.html>

<https://www.civildiary.in/2020/06/interview-based-40-questions-and.html>

**Unit 4**

**Construction Equipment and Management**

Video Tutorials: <https://www.youtube.com/watch?v=-cuCUP-Fz38>

<https://www.youtube.com/watch?v=cwNq3PI5kWI>

Theory concepts: <https://www.lkdfacility.org/wp-content/uploads/2016-06-30-BASIC-MECHANICS6_EM-Equipments-FINAL-WEB.pdf>

Sample Quiz: <https://engineeringinterviewquestions.com/construction-equipment-interview-questions-answers/>

Previous Year Question Papers:



