



**Gyanmanjari**  
Innovative University

Course Syllabus  
Gyanmanjari Diploma Engineering College  
Semester-5 (Diploma)

**Subject:** Construction Project Management & Equipments – DETCV15215  
**Type of course** Professional Core  
**Prerequisite:** NIL

**Rationale:** Managing a construction project efficiently requires planning, scheduling, risk management, resource allocation, and equipment utilization. This subject equips diploma engineering students with the fundamental knowledge and practical skills needed to manage projects effectively and make informed decisions regarding construction equipment selection and utilization.

#### Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
4	0	2	5	60	30	10	20	30	150

*Legends: CI-Classroom Instructions; T – Tutorial; P - Practical; C -- Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.*



**Course Content:**

Sr. No.	Course Content	Hrs.	% Weightage
1	<b>Introduction to Construction Project Management &amp; Planning:</b> Scope and objectives of project management, Construction project lifecycle, Roles and responsibilities of stakeholders, Work Breakdown Structure (WBS), Project planning techniques: Bar Chart, Milestone Chart, Gantt Chart, Network methods: CPM & PERT.	12	20
2	<b>Tendering, Billing &amp; Construction Accounting:</b> Tendering: Process, Types (Open, Limited, E-tendering), BOQ preparation, Bid evaluation and contract award, Work orders, mobilization, running bills, and final billing, Introduction to construction accounting: Cash flow, Budgeting and cost centres Financial planning for infrastructure, Sinking Fund: Definition, Need, and Calculation, Purpose of replacement/reserve fund for construction assets, Depreciation and lifecycle costing.	15	20
3	<b>Construction Equipments and Their Management:</b> Classification and applications, Earthmoving Equipment: Excavators, Dozers, Loaders. Concreting Equipment: Batching Plant, Transit Mixer, And Concrete Pump. Hoisting Equipment: Tower Cranes, Hoists. Compacting & Finishing Equipment: Vibrators, Rollers, Pavers. Selection criteria, productivity, and equipment planning, Maintenance and safety procedures.	15	20
4	<b>Project Monitoring, Control &amp; Resource Management:</b> Progress tracking: Daily logs, S-curves, deviation analysis, Resource management: Labour, Materials, Equipment, Resource leveling and allocation, Quality assurance and documentation, Risk management and contingency planning, Introduction to MS Project/Excel for simple project tracking, Site safety management and statutory compliance.	12	20
5	<b>Case Studies &amp; Emerging Trends in Construction Project:</b> Management, Residential Project Planning & Delays, Equipment Planning for Highway Project, Government E-Tendering & Bid Evaluation, Emerging Trends: BIM for planning and cost control, Lean construction & sustainability Automation: Drones, IoT, Robotics in project execution, Industry 4.0 in civil engineering project lifecycle.	06	20





**Continuous Assessment:**

Sr. No.	Active Learning Activities	Marks
1	<b>Mini Tender Document Preparation</b> Prepare a complete mini tender document for a residential building (G+1) for Real-World tender preparation process, including: Tender Notice, Scope of Work, Sample BOQ (5 items minimum), and Specification Sheet for Bid Submission Format. Upload online in PDF format file in GMIU Web portal.	10
2	<b>Sinking Fund Calculation Assignment</b> Calculate the sinking fund to understand lifecycle planning and reserve funds in construction required to replace the RCC roofing slab of a building after 20 years. Use appropriate rate of interest and depreciation logic. Present assumptions clearly. Upload online in EXCEL format file in GMIU Web portal.	10
3	<b>Case Study Presentation – Emerging Trend in CPM</b> Choose any one modern trend in construction project management to expose student to real-world innovations (BIM, IoT, Lean Construction, Drone Surveying, etc.) and create a PowerPoint presentation (6–8 slides) with Introduction to the Trend, Its Application in Real Projects, Benefits and Challenges, Images/Diagrams. Upload online in PPT format file in GMIU Web portal.	10
<b>Total</b>		<b>30</b>

**Suggested Specification table with Marks (Theory): 60**

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	10%	25%	25%	15%	15%	10%

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table





**Course Outcome:**

After learning the course, the students should be able to:	
CO1	Explain the principles of project planning, scheduling, and the construction life cycle.
CO2	Apply tendering procedures and prepare basic construction accounting.
CO3	Identify and classify construction equipment based on function, productivity, and usage.
CO4	Demonstrate project monitoring and control techniques,
CO5	Analyze real-world case studies and summarize emerging trends and innovations in construction management.

**List of Practical: -**

Sr. No.	Descriptions	Unit No	Hrs
1	Prepare Bar Chart & Milestone Chart for a small construction project	1	02
2	Develop CPM / PERT Network Diagram for a 10-activity project (manual + critical path)	1	04
3	Prepare a mini BOQ and material estimation sheet for small residential work	2	02
4	Fill up a sample tender form (offline or e-tender format)	2	04
5	Visit and report on at least 3 types of equipment used on-site	3	02
6	Prepare a sinking fund calculation for replacing a component (roof/road/slab)	3	04
7	Prepare a resource allocation chart and basic project cost sheet using Excel	4	02
8	Use MS Project / Excel Gantt Chart to prepare a schedule (minimum 10 activities)	4	04
9	Prepare a report on quality control checks & safety measures for a live site	5	02
10	Create a short presentation or poster on one emerging project management trend	5	04
<b>TOTAL</b>			<b>30</b>

**Instructional Method:**

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.



Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.

The internal evaluation will be done on the basis of Active Learning Assignment.

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

### Reference Books:

- [1] Construction Equipment Management by John E. Schaufelberger, Publisher: Prentice Hall, ISBN: 978-0137162673.
- [2] Construction Planning, Equipment, and Methods by Robert L. Peurifoy, Clifford J. Schexnayder, Robert L. Schmitt. Publisher: McGraw-Hill Education, ISBN: 978-0073407753.
- [3] Construction Project Management: A Practical Guide to Field Construction Management by S. Keoki Sears, Glenn A. Sears, Richard H. Clough. Publisher: John Wiley & Sons, ISBN: 978-0471745884.
- [4] Handbook of Construction Management by Abdul Razzak Rumane, Publisher: CRC Press, ISBN: 978-1482226645.
- [5] Estimating and Tendering for Construction Work by Martin Brook, Publisher: Routledge, ISBN: 978-1138838062.

