SARVAJANIK UNIVERSITY
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SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology
Civil Engineering

B. Tech. III Semester VII

Subject Name : Construction Planning and Management **Subject Code:** BTCL13701

Type of course : PCC

Prerequisite : -

Rationale : Knowledge of construction project plans, allocate resources and analyse workload, track work progress, estimation of project costs and manage budgets etc. are very important aspects of construction project management. In addition to these, various skill sets such as management of complex construction works, safety and quality in construction projects etc. needs to be required for successful execution of any project. This subject covers all above aspects required to know by the students of civil engineering.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	150
2	0	2	3	60	25	15	30	20	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	**Basics of Construction Management**: Introduction, Objectives and Scope of Construction Management. Work break down structure for various projects. Construction Projects, Phases of Construction project. Construction Planning: Need of construction planning, Constructional Resources, construction team, stages in construction, preparation of construction schedule.	4	15%
2	**Project Management:** Steps in project Management, Bar Chart, Mile stone chart, Gantt Chart, Activity On Arrow and Activity On node. Introduction to PERT: Concept of probability, normal and Beta Distribution, Central limit theorem. Time estimates and calculations of project duration, critical path, slack, probability of project completion.	8	25%

PCC: Professional Core Course

3	**Network Analysis**: Precedence Network, Critical Path Method (CPM): Introduction, Time estimates, floats, critical path, Network Crashing, Least Cost and optimum duration, Updating of networks– needs, steps, project duration, calculation for updated network. Line of balance method.	8	25%
4	**Resource Allocation and Resource Scheduling:** Various schedules i.e. Material, labour, equipment etc. Resource allocation models with and without constraints. Cash Flow analysis and expenditure schedules. Cash flow for Owner and Contractor.	5	15%
5	**Construction Equipment:** Introduction to Construction Equipment: Their contribution and importance in construction Industry. Classification of different construction Equipment, Financial aspects related to construction equipment Discounted present worth analysis, Depreciation, Cost of owning and operating construction equipment, Basics of equipment replacement policy.	5	20%

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
15	**15**	**10**	**30**	**20**	**10**

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

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.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Project Planning and Control with PERT and CPM	B.C.Punmia	Laxmi Publications (P) Ltd	2002	4th
2	Construction planning and management	P S Gehlot and B M Dhir,	New Age International Publishers ISBN-10-9386649950 ISBN-13 978-9386649959	2018	2nd
3	Construction Project management	K. K. Chitkara	McGraw Hill Education	2014	3rd

4	Construction of Structures and Management	S. C. Rangwala	Charotar Publishing House Pvt. Limited ISBN-13-9789380358499	2012	5th
5	Construction project management: Theory and Practices	Kumar Niraj Jha	Pearson Education Publishers	2016	2nd
6.	Construction Engineering & Management	S. Seetharaman	Umesh Publication ISBN:978-8188114061	2008	4th

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Learn various basic concepts related to Construction project Management. And Understand the roles and responsibilities of a project manager. *(R, U, N... Cognitive level)*	15
CO-2	Assess and solve important aspect of managing the construction project with the help of various networking techniques. *(R, U, C... Cognitive level)*	20
CO-3	Review economic analysis and financial management concepts to know economic feasibility of construction projects. *(R, U, N, E, C... Cognitive level)*	15
CO-4	Generalize safety practices in construction industry. *(R, U... Cognitive level)*	25
CO-5	Identify the equipment used in construction*(R, U, A... Cognitive level)*	25

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	1	-	1	-	2	1	1	2	1	1	3	-	1	-	1
CO-2	2	2	1	3	1	1	-	2	2	-	2	1	-	2	-
CO-3	2	-	1	-	-	-	1	1	2	-	2	-	1	-	1
CO-4	-	-	3	-	1	1	-	-	1	1	1	1	-	2	1
CO-5	-	-	1	-	2	-	-	1	-	-	2	1	2	1	1
Rationale*	5	2	7	3	6	3	2	6	6	2	10	3	4	5	4

Rationale*:
All CO's are compatible and matching to the derived POs to several extents. Knowledge of construction project plans, allocate resources and analyse workload, track work progress, estimation of project costs and manage budgets etc. are very important aspects of construction project management.

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LIST OF PRACTICALS:

1. Develop a WBD structure for the construction of one storied building; develop a bar chart for the construction of this building, including finishing activities, assuming reasonable activity durations.
2. Develop a Gantt chart for the construction of a two storied precast framed structure, including open foundations, along with list of equipment resources, assuming reasonable quantities and productivities. Calculate cost optimization and updating of the same structure.
3. A site visit of heavy construction project should be arranged to show the working of construction equipment's like dragline, bull dozers, clamshell, belt conveyors, scrappers, compactors, etc.
4. Prepare a report on the advantages of Lean construction method over conventional project management systems.
5. Prepare a report on the Safety and health precautions for a typical 3 storied building.
6. Examples on Critical Path Method.
7. Example on PERT Method
8. Example on Network Crushing and Resource allocation.
9. Example of Cost of owning and operating construction equipment.
10. Prepare a report on different Construction Equipment.

List of Open Source Software:

1. Geniebelt
2. Buildtools
3. Knowify
4. CIMS - Construction Information Management System

Other Software

1. MS Project
2. Primavera
3. Revit for BIM modeling
4. Visilean