

**JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE**  
**DEPARTMENT OF CIVIL ENGINEERING**

<b>Name of Subject</b>	<b>Project Planning and Construction Management</b>
<b>Subject Code</b>	<b>8CE4-01</b>
<b>Semester</b>	<b>VIII</b>
<b>Internal Assessment</b>	<b>30 Marks</b>
<b>External Assessment</b>	<b>120 Marks</b>
<b>Credits</b>	<b>3</b>
<b>Name of Faculty</b>	<b>Mr. Jitesh Kumar Jain</b> <b>Assistant Professor</b>

**JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE**

**CIVIL ENGINEERING DEPARTMENT**

**VISION**

**To become a role model in the field of Civil Engineering for the sustainable development of the society.**

**MISSION**

- 1) To provide outcome base education.**
- 2) To create a learning environment conducive for achieving academic excellence.**
- 3) To prepare civil engineers for the society with high ethical values.**



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Syllabus

IV Year- VIII Semester: B. Tech. (Civil Engineering)

### SCE4-01 Project Planning and Construction Management

Credit 3

Max. Marks: 150(IA:30, ETE:120)

3L+0T+0P

End Term Exam: 3Hours

SN	Course Content	Hours
1	<b>INTRODUCTION:</b> Objective, scope and outcome of the course	1
2	<b>FINANCIAL EVALUATION OF PROJECTS AND PROJECT PLANNING:</b> Capital investment proposals, criteria to judge the worth of capital projects viz. net present value, benefit cost ratio, internal rate of return, Risk cost management, main causes of project failure. Categories of construction projects, objectives, project development process, Functions of project management, Project management organization and staffing, Stages and steps involved in project planning, Plan development process, objectives of construction project management.	7
3	<b>PROJECT SCHEDULING:</b> Importance of project scheduling, project work breakdown process – determining activities involved, work breakdown structure, assessing activity duration, duration estimate procedure, Project work scheduling, Sequence of construction activities, Project management techniques – CPM and PERT networks analysis, concept of precedence network analysis.	8
4	<b>PROJECT COST AND TIME CONTROL:</b> Monitoring the time progress and cost controlling measures in a construction project, Time cost trade-off process: direct and indirect project costs, cost slope, Process of crashing of activities, determination of the optimum duration of a project, updating of project networks, resources allocation.	8
5	<b>CONTRACT MANAGEMENT:</b> Elements of tender operation, Types of tenders and contracts, Contract document, Legal aspects of contracts, Contract negotiation & award of work, breach of contract, determination of a contract, arbitration.	8
6	<b>SAFETY AND OTHER ASPECTS OF CONSTRUCTION MANAGEMENT:</b> Safety measures to be followed in various construction works like excavation, demolition of structures, explosive handling, hot bitumen work. Project Management Information System – Concept, frame work, benefits of computerized information system. Environmental and social aspects of various types of construction projects.	8
	<b>Total</b>	<b>40</b>



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Syllabus

### IV Year- VIII Semester: B. Tech. (Civil Engineering)

<b>Recommended Texts:</b>	
1	Construction Planning & management By P S Gahlot& B M Dhir, New Age International Limited Publishers
2	Construction Project planning & Scheduling by Charles Patrick, Pearson, 2012
3	Construction Project Management Theory & practice --- Kumar Neeraj Jha, Pearson, 2012
4	Modern construction management--Harris, Wiley India.
5	Construction Management & Planning by Sengupta and Guha-Tata McGraw Hill publication.
6	Project Management – K Nagrajan – New age International Ltd.
7	Professional Construction Institute Edition.
8	Construction Project Management Planning, Scheduling and Controlling- Chitakara- Tata McGraw Hill, New Delhi
9	Construction Planning, Equipment and Methods by R. L. Peurify



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Syllabus

IV Year- VIII Semester: B. Tech. (Civil Engineering)

### **8CE4-21: Project Planning and Construction Management Lab**

**Credit 1**

**Max. Marks: 50(IA:30, ETE:20)**

**OL+OT+2P**

1. Assignments on net present value, benefit cost ratio, internal rate of return
2. Types of contracts – Tenders, tender form, submission and opening of tenders, measurement book, muster roll, piecework agreement and work order.
3. Drafting of tender documents, special terms and conditions
4. Drafting of tender notices for different types of works
5. Different models of PPP like BOT, BOOT etc.
6. Arbitration
7. Preparation of bar diagram
8. Network Analysis using PERT and CPM

Office of Dean Academic Affairs  
Rajasthan Technical University, Kota

## PROGRAMME OUTCOMES (PO)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering Fundamentals and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

# **JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE**

## **DEPARTMENT OF CIVIL ENGINEERING**

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

PEO1: Contribute to the development of civil engineering projects being undertaken by Govt. and private or any other sector companies.

PEO2: Pursue higher education and contribute to teaching, research and development of civil engineering and related field.

PEO3: Successful career as an entrepreneur in civil engineering industry.

### **PROGRAM SPECIFIC OUTCOMES (PSOs):**

PSO1: Enhancing the employability skills by making the students capable of qualifying National level competitive examinations.

PSO 2: Inculcating in students technical competencies to deal with practical aspects of civil engineering.

PSO 3: Cognizance of social awareness and environmental necessity along with ethical responsibility to have a successful career and become an entrepreneur.

**Semester- VIII****Subject –Project Planning and Construction Management****Code –:-8CE4-01****Student will be able.....**

CO-1	Evaluation, Planning and Scheduling of Project.
CO-2	Estimation of time and cost for Projects.
CO-3	Manage the contracts and other issues.
CO-4	Understand safety and various aspects of construction management.

**CO-PO MAPPING**

Subject Code	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
8CE4-01	CO1	2	3	3	2	3	2	---	3	3	---	3	2
	CO2	2	3	3	2	3	---	---	---	1	---	3	2
	CO3	1	---	---	2	2	---	3	3	---	2	2	2
	CO4	1	1	2	---	3	3	3	2	3	---	---	3

**1 = Low, 2 = Medium, 3 = High****CO-PSO MAPPING**

Subject Code	COs	PSO 1	PSO 2	PSO 3
8CE4-01	CO1	3	2	2
	CO2	3	2	-
	CO3	2	-	-
	CO4	1	2	3



**Jaipur Engineering College and Research Centre, Jaipur**

**Department of Civil Engineering**

Lecture Plan						
Subject Name: Project Planning and Construction Management Subject Code: 8CE4-01 Year:4 <sup>th</sup> Semester: 8 <sup>th</sup>			POs PO1; PO2; PO3;PO4;PO5;PO6; PO7;PO8;PO9;PO11 PO12	COs 1. Evaluation, Planning and Scheduling of Project. 2. Estimation of time and cost for Projects. 3. Manage the contracts and other issues. 4. Understand safety and various aspects of construction management		
S. No.	Lecture No.	Topic to be discussed	COs	Objective of Unit	Outcome of Lecture and CO	From page to
					Students are able to:-	
	1	Introduction, objective & scope of the project planning	CO1	To aware outcome based education	Aware about outcome based education	
UNIT -1	2	Capital investment proposals, criteria to judge the worthwhileness of capital projects	CO1	To understand about Evaluation, Planning and Scheduling of Project.	Understand about capital investment proposals	T1(420-422);
	3	Net present value, benefit cost ratio	CO1		Understand benefit cost ratio	T1(82-84);
	4	Internal rate of return, Risk cost management	CO1		Understand about the Internal rate of return, Risk cost management	T1(80), T1(509)
	5	Main causes of project failure	CO1		Factors of Main causes of project failure	T1(659-660)
	6	Categories of construction projects, objectives, project development process, Functions of project management	CO1		Details about Categories of construction projects, objectives, project development process, Functions of project management	T1(162-165),T1(455-457)

	7	Project management organization and staffing, Stages and steps involved in project planning	CO1		To understand about the Project management organization and staffing, Stages and steps involved in project planning	T1(11-18)
	8	Plan development process, Objectives of construction project management	CO1		To understand of Plan development process, Objectives of construction project management	T1(454)
UNI T-2	9	Importance of project scheduling, project work breakdown process	CO2	Understand about Estimation of time and cost for Projects.	To understand the importance of project scheduling, project work breakdown process	T1(234-236-225),T1(165-166)
	10	Determining activities involved, work breakdown structure	CO2		Determining activities involved, work breakdown structure	T1(166-172)
	11	Assessing activity duration	CO2		To understand Assessing activity duration	T1(169-171)
	12	Duration estimate procedure	CO2		To understand about Duration estimate procedure	T1(108-111)
	13	Project scheduling work	CO2		To understand Project work scheduling	T1(224-225)
	14	Project management techniques – CPM networks analysis	CO2		To understand Project management techniques – CPM networks analysis	T1(189-194)

	15	Project management techniques – PERT networks analysis	CO1 CO2		To understand Project management techniques – PERT networks analysis	
	16	Concept of precedence network analysis	CO2		To understand Concept of precedence network analysis	T1(191-194)
T1(U NIT- 3	17	Monitoring the time progress	CO2	To understand cost for Projects.	Understand Monitoring the time progress	T1(246-250))
	18	Cost controlling measures in a construction project	CO2		Understand about Cost controlling measures in a construction project	T1(455-456)
	19	Time cost trade-off process	CO2		To understand Time cost trade-off process	T1(246-247)
	20	Direct & indirect Project Cost	CO2		Direct & indirect Project Cost	T1(262-264)
	21	Process of crashing of activities	CO2		Process of crashing of activities	T1(168-169)
	22	Determination of the optimum duration	CO2		Determination of the optimum duration	T1(287-288)
	23	Resources allocation	CO2		Resources allocation	T1(229-231)
	24	Updating of project networks	CO2		Updating of project networks	T1(171-172)
UNI T-4	25	Elements of tender operation	CO3	Manage the contracts and other issues	To understand elements of tender operation	T1(256)
	26	Types of tenders & Contracts	CO3		Types of tenders	T1(126-132)

	27	Contract Document	CO3		Contract Document	T1 (126-127)
	28	Legal aspects of contracts	CO3		To understand legal aspects of contracts	T1(136)
	29	Contract negotiation & award of work	CO3		To understand contract negotiation & award of work	T1 (157)
	30	Breach of contract	CO3		Breach of contract	T1 (158-159)
	31	Determination of a contract, arbitration	CO3		Determination of a contract, arbitration	T1 (158-159)
	32	Determination of a contract, arbitration	CO3		Determination of a contract, arbitration	
UNI T-5	33	Causes and prevention of accidents at construction sites	CO4	Understand safety and various aspects of construction management	Causes and prevention of accidents at construction sites	T1 (546-550)
	34	Safety measures to be followed in various construction works	CO4		Safety measures to be followed in various construction works	T1 (551-554)
	35	Excavation, demolition of structures	CO4		Excavation, demolition of structures	T1 (555-557)
	36	Explosive handling, hot bitumen work	CO4		Explosive handling, hot bitumen work	T1 (336-337)
	37	Project Management Information System	CO4		Project Management Information System	T1 (597-599)
	38	Frame work, benefits of computerized information system	CO4		Frame work, benefits of computerized information system	T1 (434)
	39	Environmental and social aspects of various types of construction projects	CO4		Frame work, benefits of computerized information system	T1(552-558)

	40	Environmental and social aspects of various types of construction projects	CO1-CO4			T1(552-558)
<b>Reference books:</b>		<b>T1:</b> Construction Project Management, Kumar Neeraj Jha Pearson <b>T2:</b> Construction Planning and Scheduling, Jimmie Hinze, Pearson				

## **Content beyond Syllabus**

### **1. Balance Sheet**

**Source : Construction Project Management by Kumar Neeraj Jha  
ISBN 978-93-325-4201-3 (Page No.397-399)**

### **2. Bar Chart**

**Source : Construction Planning and Scheduling by Jimmie Hinze  
ISBN 978-93-325-0573-5 (Page No 3-7,136-137,141-142,203-204)**