Programme	Civil Engineering	**Semester**	Fourth Semester
Course Code	20CE43P	**Type of Course**	Programme Core
Course Name	Site Management	**Contact Hours**	8 hours/week 104 hours/semester
Teaching Scheme	L:T:P :: 3:1:4	**Credits**	6
CIE Marks	60	**SEE Marks**	40

1. Rationale: Site management is a key element of the integrated project team. Site management is beneficial to society as the effective and efficient management of construction projects which will avoid escalation of costs, time overrun, wastage of resources, unlawful exploitation of labour and pollution of environment and safety precautions. Site management makes sure that the various tasks are conducted smoothly. Without site management, workers might not be authorized to work on their appointed tasks on time, equipment might not be distributed etc. It is expected that the students should know the basics of the same to apply it in the field. Through this course students will develop the desired skills and competencies which are expected from them for site management related works

2. Course Outcomes/Skill Sets: At the end of the semester, students will be able to

CO-01	Prepare a construction site plan on a project-specific basis to include phasing, temporary utilities and facilities, vertical and lateral transportation, storage facilities, security, safety, lighting, and environmental requirements.
CO-02	Manage staffing requirements including hiring, replacement and clearly articulate the roles of each individual recruited to operate while managing specific activities of construction at a given project site.
CO-03	Collect data and perform calculations periodically to enable an estimator to propose alternative construction methods, the right labour mix, equipment utilization and quality of construction for a given construction project.
CO-04	Implement an effective communication system, rigorous record keeping, safe keeping on site of product samples, project submittals, drawings etc and ensure compliance with safety norms as per OHSAS standards.

3. Course Content

Week	CO	PO	Lecture (Knowledge Criteria)	Tutorial (Activity Criteria)	Practice (Performance Criteria)
			3 hours/week	1 hour/week	4 hours/week (2 hours/batch twice in a week)
1	01	1,6	MOBILIZATION AND JOB LAYOUT 1. Concept of Key Plan & Job plan. Mobilization of construction sites. 2. Role of the owner, contractor & designer. Organization chart for private & government bodies. 3.Work Breakdown Structure, Turnkey operation.	1.Study and prepare a report on Mobilization work and job layout for different types of buildings.	1. Preparation of Key Plan, Job Layout using BIM tool like Revit/Sketch up/AutoCAD. 2. Presentation on work breakdown structure & organization structure.
2	01, 02	1,3, 6	1. Preparation of a layout plan for a residential area showing LIG, MIG and HIG houses and other amenities. 2. Preparation of a layout plan for an industrial area. 3. Concept of Bidding, Bid Terminologies, Bid Template, Bid form.	1. Collect a case study on bidding and prepare a report.	1. Collect local body by law & prepare a layout plan for LIG, MIG & HIG of small residential area using AutoCAD/Sketch up/Revit 2. Collect local bodies by law & prepare a layout plan for industrial areas using AutoCAD/Sketch up/Revit.
3	02	1,2, 6,7	1.CONTRACT & TENDERING: -Types of contracts, contract agreement, Tender- Pre tender & Post tender planning. 2. Procedure for inviting tender- Tender Notice & Tender documents, E-tendering process, E-procurement system.	1. Study on Project Feasibility. BOT, BOOT, PPP. and prepare a report	1. Procedure for uploading a tender in e-procurement. 2. Prepare & present process of tender/E-tender.

			3. Acceptance of contract documents and issue of work orders, duties and liabilities, completion certificate, right of contractor, refund of deposit.		
4	02	2,6, 7	1. EMD, Security deposit & Guaranties, Scrutiny of Tenders 2. Tender forms, comparative statements, administrative approval, technical sanction 3.Conditions for failure of contract and its extension, Termination of contract	1. Prepare & present tender documents	1. Prepare comparative statements of tender and checklist for applying & selecting Tender. 2. Prepare administrative approval & Technical approval report of any public/resident/industrial building.
5	03	1,2, 6,7	1. Nominal muster roll, measurement book, method of recording bills. 2. Pre-Measurements, check measurements, preparation of bills (Concept of RA bill- submission, scrutiny and payment.) 3.Ledger accounts, Imprest Account, Cashbook, Suspense classification, Term DPR (daily productivity report), importance of DPR	1. Site visit & data collection. 2. Prepare & present procedure of DPR.	1. Collect & study measurement books of any residential building, industrial building & public building. 2. Collect & study Cash Book, RA bill & Ledger account.
6	03, 04	1,6	1. STORES-Classification of Stores. Issues, Indents & Bin cards - maintenance inspection, inventories. 2. Work procedures adopted in P.W.D, KUWSSB, Irrigation, ZP, CMC and C.P.W.D. 3. Site Order book, Hindrance Register, Drawing Register.	1. Site visit & data collection. 2.Prepare drawing register, site order, bin card	1.snagging checklist (Snagging1-upto door & window clearance Snagging2-upto paint clearance Snagging3-Joint/grout filling clearances Snagging4-handover clearance). 2. Prepare working procedure of

			Project clearance procedure: Term Snagging, stages of snagging. Tools used for snagging.		government organization & responsibilities of technocrats.
7	04	2,4, 6,7	1. Introduction to Building Information Model (BIM), Introduction to project management tools like ERP, SAP, PRIMAVERA, MSP, Project Kick start, Smarta etc. 2. Sequence of construction activity. 3. PLANNING AND SCHEDULING: Project Organization	1. Conduct a Case study on Project Management tools like ERP, R CONSTRUCT, QUADRA, SAP, MSP, PRIMAVERA etc...	1.Prepare schedule for any building from mobilization to Lintel work using MS project/PRIMAVERA 2.Prepare schedule for any building(continue) from Lintel to Slab casting using MS project/PRIMAVERA
8	04	2,4, 6,7	1. Bar Charts. Gantt chart 2. Networking techniques 3. Development of a network using CPM with simple problems.	1.Site visit	1.Prepare schedule for any building (continuous) slab casting to door & window fixing using MS project/PRIMAVERA
9		2,4, 6,7	1. Line of Balance Scheduling 2.Simple problem on PERT 3. Time-Cost Trade-off, Cost Control in Construction. Importance of Management Information System.	1.Site visit & data collection 2. Prepare Working tracking report using spreadsheet.	1.Prepare schedule for any building(continue)from door & window fixing to hand over using MS project/PRIMAVERA
10	02, 04	3,6, 7	1. RESOURCE MANAGEMENT: Resource Planning, allocation and levelling. 2. Introduction to Material Management, Purchase management and inventory control. 3. Importance of PR (Purchase request), PO (Purchase order), WO (work order), GRN (goods received note).	1. Site visit.	1 Site visit & prepare Lead time chart for A, B & C class materials & link with scheduling. 2. Calculate man hours for construction activity & link with scheduling.

11	05	5,6, 7	1.ENVIRONMENTAL HEALTH AND SAFETY(EHS): ACCIDENTS-definition of accident terms: (Partial & total disablement, Injury frequency rate, injury severity rate). 2. Accident- Causes, Precaution & Prevention in each construction activity. Hazards on Construction Sites 3. SAFETY- Importance of safety. Safety procedures and checklist for each construction activities as per OHSAS	1. Case study on hazards in construction. 2. Demonstrate on Safety measures in construction site personal protective kit, Tool kits according to construction activity	1 & 2. Site visit & Prepare safety checklist for construction activity.
12	03, 04	5,6, 7	1. Safety meetings, Safety measures for storage, handling of building material and execution. 2. QUALITY MANAGEMENT: Total Quality Management (TQM)-Introduction, Importance & Functions of total quality management in the construction industry. 3. Tools for quality control, Elements and requirements of quality management.	Study the advanced techniques used to improve the quality of construction.	1.Field visit and demonstration 2.Prepare Third- party certification, Concept of ISO, Features of ISO9000 series, Benefit of ISO9000(ISO Certification, NABL certification)
13	03, 04	2,5, 6,7	1. Aims and ways of TQM. BIS certification of quality system. 2.Claims, compensation and disputes, Dispute resolution techniques, Introduction to Arbitration and Conciliation Act 1996 – case studies 3.Acts & Labour Laws	Site visit & data collection	1 & 2: Case study on preparation of technology manual for each activity
Total in hours			**39**	**13**	**52**

NOTE 1: The course content shall be delivered through lectures, PowerPoint presentations, video demonstrations and field visits

NOTE 2: The TUTORIAL (Activity criteria) shall be conducted / executed by the student (Minimum ONE suggested activity from each week) and to be submitted in portfolio evaluation of activities through rubrics to the faculty.

NOTE 3: The PRACTICE (Performance criteria) shall be conducted by the student and observations and report to be submitted at the end of each session to the faculty

4. CIE and SEE Assessment Methodologies

Sl. No	**Assessment**	**Test Week**	**Duration** In minutes	**Max marks**	**Conversion**
1.	CIE-1 Written Test	5	80	30	Average of three tests 30
2.	CIE-2 Written Test	9	80	30	
3	CIE-3 Written Test	13	80	30	
4.	CIE-4 Skill Test-Practice	6	180	100	Average of two skill test reduced to 20
5	CIE-5 Skill Test-Practice	12	180	100	
6	CIE-6 Portfolio continuous evaluation of Tutorial sessions through Rubrics	1-13		10	10
Total CIE Marks					60
Semester End Examination (Practice)			180	100	40
Total Marks					**100**

5. Format for CIE written Test

Course Name	**Site Management**	Test	I/II/III	Sem	III/IV
Course Code	**20CE43P**	Duration	80 Min	Marks	30
Note: Answer any one full question from each section. Each full question carries 10 marks.					
Section	Assessment Questions		Cognitive Levels	Course Outcome	Marks
I	1				
	2				
II	3				
	4				
III	5				
	6				
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, Cognitive level and course outcomes.					

6. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		2	4	6	8	10	
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	8
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	6
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	2
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	2
	Average Marks= (8+6+2+2)/4=4.5						**5**

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

7. Reference:

Sl. No.	Description
1	**Town Planning** by Rangwala
2	Collier, Kieth, "**Managing Construction Contracts**"
3	Gajaria GT, **"Law Relating to Building & Civil Engg. Contracts in India**"
4	Frank Harris and Roland McCaffer, "Modern Construction Management"- 4th Ed. Blackwell Science Ltd. 2009
5	Chitkara K K, "**Construction Project Management, Planning, Scheduling and Controlling**, McGraw Hill Education, 3rd Ed., 2014
6	Srinath L.S, **"PERT and CPM**", East West Press Pvt Ltd New Delhi
7	Peurifoy. R L, **"Construction Planning, Equipment and Methods**"- McGraw Hill.
8.	www.eprocure.gov.in
9.	www.OHSAS.co.in
10.	ISM codes (International safety management)

8 a. CIE Skill Test 1 - Scheme of Evaluation

SL. No.	Particulars/Dimension	Marks

1	Portfolio evaluation for practice sessions -Performance criteria (Observations and report)	10
2	Preparing Key Plan, Job Layout using Revit/Sketch up/CAD.	20
3	Prepare work breakdown structure of construction work & organization structure (private or government) using cadd or ms word	20
4	Write an e procurement procedure & prepare a checklist before, during & after applying e tender.	20
5	Prepare check list of snagging1 / snagging2 / snagging3 and 4 using MS office	20
6	Viva-Voce	10
	Total Marks	**100**

8. b. CIE Skill Test 2 - Scheme of Evaluation

SL. No.	Particulars/Dimension	Marks
1	Portfolio evaluation for practice sessions -Performance criteria (Observations and report)	10
2	a. Prepare schedule for any building from mobilization to Lintel work using MS project/PRIMAVERA **OR** b. Prepare schedule for any building(continue) from Lintel to Slab casting using MS project/PRIMAVERA	20
3	a. Prepare schedule for any building(continue)slab casting to door & window fixing using MS project/PRIMAVERA **OR**	20

	b. Prepare schedule for any building(continue)from door & window fixing to hand over using MS project/PRIMAVERA	
4	Prepare a safety checklist for excavation, SSM, BBM or scaffolding, centering, form work.	20
5	Prepare a safety checklist for plastering, roofing, flooring, painting works & Prepare Third- party certificate using ms office.	20
6	Viva-Voce	20
	Total Marks	**100**

Note for the Examiner:

1. The choice between the questions 2a and 2b shall be done by the examiner.
2. The choice between the questions 3a and 3b shall be done by the examiner.

8. c. SEE Scheme of Evaluation

SL. No.	Particulars/Dimension	Marks
1	a. Preparing Key Plan, Job Layout using Revit/Sketch up/CAD **OR** b. Prepare work breakdown structure of construction work & organization structure (private or government) using AutoCAD or MS office.	20
2	Prepare a checklist of snagging1 / snagging2 / snagging3&4 using MS office.	10
3	Prepare schedule for any construction building work using MS project/PRIMAVERA	30
4	Prepare a safety checklist for any THREE of the following activities. a. Excavation b. Foundation c. SSM d. BBM/Block Masonry e. Scaffolding f. Formwork g. Roofing	20

	h. Flooring, painting works. Prepare Third- party certificate using ms office.	
5	Viva-Voce	20
	Total Marks	**100**

Note for the External Examiner:

1. The choice between the questions 1a and 1b shall be done by the external examiner.

9. Equipment/software list with Specification for a batch of 20 students

Sl. No.	Particulars	Specification	Quantity
1	MS project/PRIMAVERA	Ver.2010 & above/PRIMAVERA P7 & above	1 licensed/Institute
2	AUTOCAD	Ver.2020	1 licensed/Institute
3	Sketch up/3D MAX	Ver.2018 & above	1 licensed/Institute
4	Computer/Laptop	I5, SSD512 MB, 2GB graphic card	20computer/batch
5	Printer	LaserJet printer	1no/batch