GOVERNMENT POLYTECHNIC, BOLANGIR

NAME OF THE FACULTY : Mr. Abinash Biswal , Lecturer (STAGE-II,Civil Engineering)

Subject: CONSTRUCTION MANAGEMENT
Program: Diploma in Civil Engineering
Semester: 6TH sem syllabus
Total Contact Hours: 60 Total Marks: 100
Assessment: Internal Assessment – 20, End Term – 80

COURSE OBJECTIVE:

On completion of the course students will be able to-

1. Develop schedules for construction project
2. Realize significance of organizational behavior towards successful functioning
3. Explain the important terminology related to materials management, site management, equipment management and labor management
4. Understand construction quality indicators and their measurement
5. Apply methods to measure and monitor progress of work
6. Realize significance of safety requirement and regulations at workplace
7. Understand the importance and usage of the Vulnerability Atlas of India in construction Projects.

Hour	Topic	Subtopic	Teaching Aids/Activities	Course Objective
	Introduction To Construction Management	**4HRS**		
1	Aims and objectives of construction management.	Efficient project planning and execution,Timely completion of projects,Cost control and budget management,Quality assurance,Safety	PPT, Chalk & Board	CO1

2	Functions of construction management.	Planning,Organizing,Scheduling,Directing, Coordinating, Controlling,Staffing, Budgeting,Quality control, Safety management	PPT, Chalk & Board	CO1
3	The construction team components	owner,engineer,architect,contractor-their functions and interrelationship and jurisdiction.	PPT, Chalk & Board	CO1
4	Resources for construction management	men,machines,materials,money	PPT, Chart	CO1
	Constructional Planning	**7HRS**		
5	Importance of Construction Planning	Requirements, characteristics, quarrying methods, dressing process	Stone samples, Board	CO2
6	Developing work breakdown structure for construction work	Structure, properties, seasoning, preservation, defects, bamboo uses	Timber & bamboo samples, PPT	CO2
7	Construction Planning stages-Pre-tender stage, Post-tender stage.	Properties, differences, uses in road works & waterproofing	Samples, PPT	CO2
8	Construction scheduling by Bar charts-preparation of Bar Charts for simple construction works.	Types, properties, uses of lime; soil types & suitability for foundations	Lime sample, Soil charts	CO2
9	Preparation of schedules for labour materials,machinery, finance for small works Limitation of Bar charts	Preparation of schedules for labour materials,machinery, finance for small works Limitation of Bar charts	Lime sample, Soil charts	
10	Construction scheduling by network techniques	Definition,Objectives,Importance,Types of network techniques,Critical Path Method CPM,Program Evaluation and Review Technique PERT,Network	Lime sample, Soil charts	

11	defination of terms ,PERT and CPM techniques, advantages and disadvantages of two techniques, network analysis, estimation of time and critical path	application of PERT and CPM techniques in sample construction works.	Sand & aggregate samples	CO2
	Materials and Stores Management	**4HRS**		
12	Classification of Stores-storage of stock.	Centralized stores, Decentralized stores, Site stores, Departmental stores,	Brick samples, PPT	CO2
13	Classification of Stores-storage of stock.	Indoor storage,Outdoor storage,Covered storage, Open storage,Bin storage, Rack storage	Tile samples, PPT	CO2
14	Issue of materials-indent , invoice, bin card	Issue of materials-indent , invoice, bin card	Samples, PPT	CO2
15	Issue of materials-indent , invoice, bin card	Issue of materials-indent , invoice, bin card	Samples, PPT	CO2
	Construction Site Management	5HRS		
16	Job Lay out-Objectives, Review plans,	Composition, dry & wet manufacturing (flow chart), types, field tests	Cement sample, PPT	CO1
17	specifications, Lay out of equipments.	Physical properties of OPC, PPC: fineness, consistency, setting time, strength	Lab demo, BIS charts	CO1
18	Location of equipment, organizing labour at site.	Selection of site location, Accessibility, Safety considerations,Power and water availability, Space requirement	Lab demo, BIS charts	

19	Job lay out for different construction sites.	Lab tests: fineness, setting time, soundness, compressive strength	Lab equipment	CO1
20	Principle of storing material at site.	Rapid hardening, low heat, PPC, sulphate resisting, high alumina, white	Chart, PPT	CO1
	Construction Organization:	**6HRS**		
21	Introduction –	Characteristics, Structure, importance.	PPT, Chart	CO4
22	Organization types-	-line and staff, functions and their characteristics	Board, PPT	CO4
23	Principles of organization	meaning and significance of terms-control, authority, responsibility, job & task.	Board, PPT	CO4
24	Leadership-necessity, styles of leadership, role of leader	Leadership-necessity, styles of leadership, role of leader	Lab demo	CO4
25	Human relations-relations with subordinates peers, Supervisors, characteristics of group behavior, mob psychology, handling of grievances	mob psychology, handling of grievances,	Chart	CO4
26	Conflicts in organization-genesis of conflicts, types-intrapersonal, interpersonal, intergroup, resolving conflicts	absenteeism, labour welfare.	Case studies, PPT	CO4

	Construction Labour and Labour Management:	6HRS		
27	Preparing Labour schedule	Objectives, methods of mix design	PPT, IS code	CO5
28	Essential steps for optimum labour output	Stepwise procedure	Board, IS 10262	CO5
29	Labour characteristics	Principle, factors affecting rebound index	Lab demo	CO5
30	Wages & their payment	UPV test, interpretation	Lab demo	CO5
31	Labour incentives	Objectives of labour incentives,Types of labour incentives,Financial incentives,Non financial incentives,Bonus system,Piece rate system,Profit sharing,Group	Board, PPT	
32	Motivation- Classification of motives, different approaches to motivation.	Motivation- Classification of motives, different approaches to motivation.	Lab demo	CO5
	Equipment Management			
33	Preparing the equipment schedule	Batching, Mixing, Transportation, Placing, Compaction, Curing and Finishing of concrete.	Lab demo	CO6

34	Identification of different alternative equipment	Different types of form works 5 for beams, slabs, columns, materials used for form work, requirement of good form work	Samples, PPT	CO6
35	Importance of Owning & operating costs in making decisions for hiring & purchase of equipment	Stripping time for removal of form works perIS 456.	Plastic samples	CO6
36	Importance of Owning & operating costs in making decisions for hiring & purchase of equipment	Importance and need of waterproofing, methods of waterproofing and mate rials used for waterproofing.	PPT, Samples	CO6
37	Inspection and testing of equipment	Purpose of inspection,Types of inspection.Visual inspection.Dimensional inspection.Performance testing.Routine testing.Acceptance testing.Maintenance	PPT, Samples	
38	Equipment maintenance	Types of joints, methods for joining old and new concrete, materials used for filling joints.	Case studies	CO6
	Quality Control	**5 HRS**		
39	Concept of quality in construction	Properties, advantages and limitation of types of Special concrete Ready mix Concrete	Samples	CO6
40	Quality Standards-	Properties, advantages and limitation of types of Special concrete Fiber Reinforced Concrete, High performance Concrete	PPT, Case study	CO6
41	Quality Standards-	Properties, advantages and limitation of Self compacting concrete and light weight concrete.	Samples, PPT	CO6

42	Quality Standards-	effect of cold weather on concrete, precautions to be taken while concreting in cold weather condition. (only concepts)	Samples, PPT	CO6
43	destructive & non destructive methods.	effect of hot weather on concrete, precautions to be taken while concreting in hot weather condition. (only concepts)	Interactive session	CO6
	Monitoring Progress	6HRS		
44	Programme and progress of work	Bar chart, Gantt chart,Network diagram,Scheduling of activities,Time estimation	PPT, Chart	CO3
45	Programme and progress of work	Bar chart, Gantt chart,Network diagram,Scheduling of activities,Time estimation	PPT, Chart	CO2
46	Work study	Work study	PPT, Case study	CO3
47	Work study	Work study	PPT, Case study	CO2
48	Analysis and control of physical	Measurement of physical progress,Methods of analysis,Comparison with planned progress,Identification of deviations,Corrective actions,Reporting and documentation	Case studies, PPT	CO3
49	financial progress corrective measures.	financial progress corrective measures.	Case studies, PPT	CO2

	Safety Management In Construction	**5HRS**		
50	Importance of safety	Safety Importance, Why Safety Matters, Importance of Safety, Safety Matters, Value of Safety,Safety First	Samples, PPT	CO2
51	causes and effects of accidents in construction works	Construction Accidents, Causes & Effects of Accidents, Construction Accident Causes, Accidents in Construction, Worksite Accident Impacts, Construction Safety Risks	Samples, PPT	CO3
52	Safety measures in worksites for excavation	scaffolding, formwork, fabrication and erection, demolition.	PPT, Chart	CO2
53	Development of safety consciousness	Safety Awareness, Safety Consciousness,Building Safety Awareness, Safety Mindset, Culture of Safety, Safety First	PPT, Chart	CO3
54	Safety legislation	Workman's compensation act, contract labour act.	PPT, Chart	CO2
	Role of Vulnerability Atlas of India in construction projects	**6HRS**		
55	Introduction to Vulnerability Atlas of India Definition of disaster related terms.	Concepts of natural hazards and disasters and vulnerability profile of India.	Samples, PPT	CO1
56	Earthquake hazard and vulnerability, Magnitude and intensity scales of earthquake, seismic zones, earthquake hazard maps, types of structures and damage classification, effects in housing and resistant measures	Earthquake hazard and vulnerability, Magnitude and intensity scales of earthquake, seismic zones, earthquake hazard maps, types of structures and damage classification, effects in housing and resistant measures	Samples, PPT	CO2

57	Wind / Cyclone hazard and vulnerability, wind speed and pressures, wind hazard and cyclone occurrence maps, storm surveys and cyclone resistant measures.	Wind & Cyclone Hazards, Wind Speed and Pressure Effects, Cyclone Occurrence & Hazard Maps, Storm and Cyclone Surveys,Cyclone-Resistant Design Measures	Samples, PPT	CO2
58	Flood hazard and vulnerability, Flood hazard and Flood prone areas of the country, General protection of habitants and flood resistant construction.	Flood hazard and vulnerability, Flood hazard and Flood prone areas of the country, General protection of habitants and flood resistant construction.	Samples, PPT	CO2
59	Landslides, Tsunamis and Thunderstorm hazards and vulnerability, Landslide & Thunderstorm incidence maps, Measures against Tsunami hazards.	Landslides, Tsunamis and Thunderstorm hazards and vulnerability, Landslide & Thunderstorm incidence maps, Measures against Tsunami hazards.	Samples, PPT	CO3
60	Housing vulnerability risk tables and usage of vulnerability atlas of India, Inclusion of vulnerability atlas in Tender documents.	Housing vulnerability risk tables, Usage of the vulnerability atlas of India, Inclusion in tender documents	Samples, PPT	CO2

Signature of Faculty **Signature of HOD**