

## B.E. Semester: VI

### Department of Civil Engineering

**Subject Name: Construction Equipments and Management (CV601-N)**

**Course Category: Program Course Core (PCC)**

#### A. Objectives of the Course:

- To take up important concepts of fluid flows to the civil engineers managing and designing systems of various fluid flows
- To develop a student's skills in analyzing fluid flows through the proper use of modelling and the application of the basic fluid-flow principles

#### B. Teaching & Evaluation Scheme:

Teaching Scheme				Credit	Evaluation Scheme					Total Marks
L hrs	T hrs	P hrs	Total Hrs		Theory		IE	CIA	Pra/Viva	
					Hrs	Marks	Marks	Marks	Marks	
3	1	0	4	4	3	70	30	20	30	150

#### C. Detailed Syllabus:

##### 1. Construction Management:

Introduction, Objectives and Scope of Construction Management, Work Break Down Structure for Various Projects, Construction Resources

##### 2. Management Techniques:

PMC and Conventional Methods: Gantt Bar Chart, Mile Stone Chart, Line of Balance (L O B) Technique, Introduction of PMC

##### 3. Network Analysis: Critical Path Method (CPM):

Introduction , Basic Assumption Made for Creating a Network, Terminology, Types of Networks, Network Rules, CPM, Bar Chart, Type of Floats and Their Significance, Time Grid Diagram, Updating of Networks and Time Cost Optimization, Terms and Definitions : Event, Activity, Dummies, Interrelationship of Events, Interrelationship of Activity

- 4. Resource allocation and Resource Scheduling:**  
Various Schedules I.E. Material, Labour, Equipment Etc, Resource Allocation Models With and Without Constraints, Difference between PERT and CPM
- 5. Program Evaluation and Review Technique (PERT):**  
Activities and Project Time Estimates for Probabilistic Model, Time Estimates: TL, TE, And Evaluation of Project Completion Time Probabilities, Comparison between Deterministic and Probabilistic Approaches
- 6. Cash Flow analysis and expenditure schedules:**  
Cash flow for Owner and Contractor; Job Layout, Supervision and Safety in Large Construction Projects
- 7. Construction Equipment:**  
Introduction to Construction Equipment: their Contribution and Importance in Construction Industry, Classification of Equipment, Financial Aspects Related To Construction Equipments: Discounted Present Worth Analysis, Depreciation, Cost of Owning and Operating Construction Equipment, Basics of Equipment Replacement Policy
- 8. Engineering fundamentals:**  
Related to Performance of IC Engines, Rim Pull, Drawbar Pull, Coefficient of Traction, Gradability, Soil Fundamentals
- 9. Excavating Equipment:**  
Power Shovels, Draglines, Hoes, Clam Shells and Trenching Machines, their Basic Parts, Operation, Output Estimation, Factors Influencing Output and Methods to Enhance it, Tractors and Related Equipment: Bulldozers, Rippers, Scrapers & Overview of Other Equipment
- 10. Belt conveyor system:**  
Terminology, Classification, Components, Power Requirement Estimation and Design
- 11. Hauling equipment:**  
Trucks and Wagons, Operation and Guideline for Selection and Deployment

**D. Lesson Planning:**

<b>Unit No</b>	<b>Title of the Unit</b>	<b>Minimum Hours</b>	<b>Weightage (%)</b>
1	Construction Management	05	10
2	Management Techniques	04	05
3	Network Analysis: Critical Path Method (CPM)	10	15
4	Resource allocation and Resource Scheduling	04	10
5	Programme Evaluation and Review Technique(PERT)	04	11
6	Cash Flow analysis and expenditure schedules, Job Lay out, Supervision and Safety in Large Construction Projects.	07	12
7	Construction Equipment	07	08
8	Engineering fundamentals	04	08
9	Excavating Equipment	06	08
10	Belt conveyer system	03	08
11	Hauling equipment	06	05
<b>Total:</b>		<b>45</b>	<b>100</b>

**E. List of Practical/Assignments:**

- Minimum 10 theories from each unit

**F. Instructional method and pedagogy (Continuous Internal Assessment Scheme CIA):**

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures, practical and tutorial which carry 05 marks.
- At regular intervals assignments is given. In all, a student should submit all assignments of 05 marks each.
- Classroom participation and involvement in solving the problems in tutorial rooms carries 05 marks.
- Viva voce will be conducted at the end of the semester of 05 marks.

- One internal exam of 30 marks is conducted as a part of mid semester evaluation.

### **G. Students Learning Outcomes:**

On the successful completion of this course

- Adopting the ethical knowledge for Construction & project management
- The students will get the experience to make proper site management & specification for equipment for construction work
- The student will get in depth knowledge of resource & contract management & cost management on site

### **H. Recommended Study Materials:**

#### **a. Text book & Reference Books:**

1. Sharma, M.R., Fundamentals of Construction Planning and Management, S.K. Kataria & Son, New delhi, 2012
2. Seetharaman, S., Construction Engineering & Management, Umesh Publications, 2007
3. Srinath, L.S., PERT & CPM Principles and Applications, Tata McGraw Hill, New Delhi
4. Peurifoy, L., Schexnayder, C.J. and Shapira, A., Construction Planning, Equipment and Methods, McGraw Hill, New Delhi, 8th Edition, 2010.
5. Punamia, B.C. and Khandelwal, K.K., Project Planning and Control with PERT and CPM, Laxmi Publications, New Delhi, 20
6. R.L. Peurifoy and W.B. Ledbetter, "Construction Planning, Equipments and Methods" McGraw-Hill Publishers. New Delhi.
7. D. Weist and F.K. Levy, "A Management Guide to PERT/ CPM", Prentice Hall of India Pvt. Ltd.
8. B.C. Punmia and K.K Khandelwal, "Project Planning and control with PERT &
9. CPM" Laxmi Publication Pvt. Ltd. New Delhi.
10. P.S. Gahlot and B.M. Dhir, "Construction Planning and Management", New Age International Pvt. Ltd., New Delhi.
11. Sharma, S.C., Construction Equipment & Managemetn, Khanna Publications, New Delhi, 1988.

12. Sengupta and Guha, Construction Management and Planning, Tata McGraw Hill, New Delhi.
13. Chitkara, K. K., Construction Project Management Planning, Scheduling and Controlling, Tata McGraw Hill, New Delhi.
14. Chitkara, K. K., Construction Project Management Techniques and Practices, Tata McGraw Hill, New Delhi, 2004

**b. Web Materials:**

1. [http://nptel.iitm.ac.in/courses/IITMADRAS/Infrastructure\\_Planning\\_Management/index.php](http://nptel.iitm.ac.in/courses/IITMADRAS/Infrastructure_Planning_Management/index.php)
2. [http://www.deere.com/en\\_US/cfd/construction/deere\\_const/media/pdf/attachments.pdf](http://www.deere.com/en_US/cfd/construction/deere_const/media/pdf/attachments.pdf)
3. [http://www.fta.dot.gov/documents/Construct\\_Proj\\_Mangmnt\\_CD.pdf](http://www.fta.dot.gov/documents/Construct_Proj_Mangmnt_CD.pdf)
4. <http://www.netmba.com/operations/project/pert/>
5. <http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-20Guwahati/cpm/index.html>
6. <http://www.youtube.com/watch?v=wJ8HZ7hqUs8>
7. <http://www.youtube.com/watch?v=IOh-erkINAo>
8. <http://www.youtube.com/watch?v=2Ow8JUgRC1Q>
9. <http://www.youtube.com/watch?v=UEXrsZ3vKx0>
10. <http://www.youtube.com/watch?v=6cCaY3zBhcs>
11. <http://www.youtube.com/watch?v=HPC41WTMjRM>
12. <http://www.youtube.com/watch?v=RYnUDLey-g4>