



**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani**  
**Pilani Campus**  
**AUGS/ AGSR Division**

**SECOND SEMESTER 2020 - 2021**

**Course Handout Part-II**

**Date: 16-01-2021**

In addition to part -I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

**Course No.** : CE F242

**Course Title** : CONSTRUCTION PLANNING & TECHNOLOGY

**Instructor-in-charge** : G MUTHUKUMAR

**Lecture Instructors** : G. Muthukumar, Mukund Lahoti

**Tutorial Instructors** : Mukund Lahoti (*Sec 1*), Shreyas Pranav (*Sec - 2*)

**Google Meet link (For Lecture classes):** [meet.google.com/pjb-jxim-qrs](https://meet.google.com/pjb-jxim-qrs)

**1 Course Description:** The course deals with planning techniques, engineering economy, valuation including estimation & costing, system design, construction methodologies ranging from small buildings to large infrastructure projects, construction technologies including recent advancement. Relevant Indian Standard codes of practices will be given emphasis.

**2 (a): Scope of the Course:**

The scope of the course is to know the various aspects of construction planning and management right from the knowledge of various activities till the estimation, costing, valuation, tendering etc., Though this course covers wider infrastructure projects, the primary focus will be on building and road infrastructure.

**2(b): Objectives of the course:**

- To understand the different construction projects and basic objective of project management [**Module - I**]
- To understand the project management techniques (CPM and PERT) [**Module - II**]
- To analyze the various requirements of manpower and other resources [ **Module-III**]
- To analyze the various control methodologies keeping in line with project requirements [**Module-IV**]
- To get exposed to construction contracts and tenders [**Module-V**]
- To estimate the quantity and rate of different building components (including materials) [**Module VI**]
- To discuss the various aspects of valuation of properties [**Module VII**]
- To highlights various aspects of construction quality and safety with case studies [**Module VIII**]
- To understand the best practices of construction management [**Module IX**]

**3 (a). Text Book:**

- T1. Gupta R. (2015) “Construction Planning & Technology”, CBS Publishers, New Delhi.
- T2. Punmia, B.C. (2008). “Building Construction”, Laxmi Publication Pvt. Ltd., New Delhi.



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**3 (b). Reference Books:**

- R1. Kumar Neeraj Jha, Construction Project Management, Pearson India publications
- R2. K.K. Chitkara Construction Project Management, Tata McGraw Hill publications.
- R3. David Pratt, Fundamentals of Construction Estimates, 3<sup>rd</sup> edition, Cengage publications.
- R4. Albert Lester, Project Management, Planning and Control, 7<sup>th</sup> edition, BH (Elsevier) publications
- R1. Relevant B.I.S Codes and SP-7, [National Building code (NBC) of India, - latest versions – two volumes]

**4. Course Plan**

| Mod. No. | Module                                     | Topics to be covered  | No. of Lec. | Learning outcomes   |
|----------|--|---|-------------|---|
| 1        | Introduction to Construction management    | <ul style="list-style-type: none"> <li>Construction Industry</li> <li>Project categories</li> <li>Project classification</li> <li>Project Life cycle</li> <li>Project participants</li> <li>Project Management and Functional Management</li> </ul>                           | 3           | To get overall exposure about construction management principles  |
| 2        | Project Scheduling with CPM and PERT       | <ul style="list-style-type: none"> <li>Project Networking Techniques</li> <li>Construction of Project Network</li> <li>Path of the project along with various steps</li> <li>Determination of critical path and activities, crashing of network</li> </ul>                    | 7           | To understand various construction activities and   |
| 3        | Resource Planning including time planning  | <ul style="list-style-type: none"> <li>Planning construction manpower</li> <li>Planning construction materials</li> <li>Project construction equipment including selection of equipment, introduction to NPV</li> <li>Construction costs &amp; construction budget</li> </ul> | 6           | To evaluate the comprehensive details of the various key planning operations (manpower, materials, equipment) |
| 4        | Planning control system and EVM            | <ul style="list-style-type: none"> <li>Project control methodology</li> <li>Resources productivity control</li> <li>Project cost control</li> <li>Project Time control</li> <li>Earned Value Management</li> </ul>  | 7           | To idealize the correct control methodology to be adopted for a project                                       |
| 5        | Tenders, contracts, and Dispute resolution | <ul style="list-style-type: none"> <li>Types of contracts.</li> <li>Contracts terms and conditions, special clauses, terminologies</li> <li>Dispute cases, termination, liquidation, incentive, JOC,</li> <li>Discussion on actual tender document</li> </ul>                 | 4           | To get the adequate confidence in preparing tender documents including overview of costs.                     |
| 6        | Estimation of various building components  | <ul style="list-style-type: none"> <li>Cost aspects of various projects (Case studies), pricing of various activities (earthwork excavation, equipment etc)</li> <li>Types of estimates</li> <li>Activity wise cost estimates (case studies)</li> </ul>                       | 5           | To get the hold on estimation, costing, pricing of major components/activity.                                 |
| 7        | Construction Valuation                     | <ul style="list-style-type: none"> <li>Valuation, engineering economy</li> </ul>  | 3           | To comprehend the various guidelines and specifications in the valuation of buildings                         |



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|   |   |   |           |   |
|---|---|---|-----------|---|
|   |   | <ul style="list-style-type: none"> <li>Discussion on guidelines on valuation of immovable properties (standard practice, specifications, methods)</li> </ul>  |           |   |
| 8 | Construction quality and safety           | <ul style="list-style-type: none"> <li>Construction quality</li> <li>Inspection, Quality Assurance</li> <li>Cost of quality and ISO standards</li> <li>Causes of low labor productivity</li> <li>Accident Causation Theories</li> <li>Safety and Health Management system</li> <li>Research results in safety management</li> </ul> | 2         | To understand the quality and safety aspects of construction      |
| 9 | Best practices of Construction Management | <ul style="list-style-type: none"> <li>Construction companies' best practices.</li> <li>Introduction to Building Information Modeling (BIM)</li> <li>Failures of projects</li> </ul>  | 2         | To acknowledge the best practices adopted by construction giants. |
|   |   | <b>Total</b>  | <b>40</b> |   |

**5. Evaluation Scheme:**

| Component  | Duration | Weight | Date & Time   | Remarks |
|--|----------|--------|---|---------|
| Mid Test   | 90 min   | 35%    |   | CB      |
| Tutorials (Best 4 out of 6) – 2 buffers and hence no makeup feasible |          | 10%    | Total 4 Evaluative Tuts (4 x 2.5 = 10%)                         | OB/CB   |
| End Semester Project (BIM Software based Revit - GroupWise)          |          | 15%    | Start date: Feb 1, 2020; Deadline: April 20 <sup>th</sup> 2020. | OB      |
| Comprehensive Examination  | 3 hours  | 40%    |   | CB      |

**6. Mid Semester Grading [Mid Sem. +4 Tutorials] = [35+10 = 45]; The entire course will be for 200 marks [Mid Sem - 70 marks + Tut – 20 marks + Project – 30 marks + End Sem 80 marks]**

**7. Chamber Consultation Hour:** Saturday 12 Noon – 1 PM

**8. Reading assignments will be given as and when necessary**

**9. Notices:** Notices will be sent through your BITS mail only.

Instructor-in-charge  
CE F242