SCHOOL OF STEM SYLLABUS

TERM:

INSTRUCTOR:

COURSE CODE: CNM-230

OFFICE HOURS:

COURSE TITLE: Construction Project Planning and Control

OFFICE LOCATION:

DAY(S) AND TIME(S):

EMAIL:

LOCATION:

PHONE:

COURSE PREREQUISITE: None

CREDITS: 4

COURSE DESCRIPTION:
Students develop a basic understanding of project planning by comparing alternative designs and construction plans, methods of contracting, design management, and forms of information flow. Activities include writing contract proposal, identifying core problems in a proposal and their mitigation, preparing master plan schedules, tendering procedures, contractor cost calculations, and bid preparation. Students learn to budget, to plan and schedule construction, to manage production, and to employ project controls. Students acquire a basic level of proficiency in appropriate software. Concepts introduced during lecture will be reinforced during lab sessions.

STUDENT LEARNING OUTCOMES:

Upon successful course completion, students will:

1. **Understand** bidding process, types of proposal, proposal writing, and different techniques of project scheduling.
2. **Develop** proposal plan, templates, and project controls.
3. **Identify** constructability issues, propose their solutions, and avoid failure risks.
4. **Define** deliverables and success criteria
5. **Understand** key elements of the proposal, risk analysis and cost control measures of a project

TEXTBOOK AND SUPPLEMENTAL MATERIALS:

Proposed student texts: All material will be from the book given below

Construction Project Management, K K Chitkara;
ISBN-13: 978-9353166274
ISBN-10: 9353166276
Publisher: McGraw Hill India, 4th Edition

GRADING POLICY:

Attendance and Participation	**5%**
Assignments	**20%**
Quizzes	**15%**
Midterm	**30%**
Final Exam / Project	**30%**

SAMPLE COURSE SCHEDULE:

Schedule	Lecture Topic	Student Learning Objectives (SLO)
Week 1	**Introduction to Construction Project Planning.** 1. Contract proposals and their types 2. Essentials of a good proposal (scope, objectives, and organization) 3. Project's Scope, features, and characteristics. 4. Development, phases, and processes 5. Project Organization, Role of construction manager 6. Main Causes of failure 7. Importance of planning, scheduling, and controls 8. **Lab: Capstone Project:** Assigning the Capstone Project.	1,2
Week 2	**Planning Project Work Scope and it's integration Process** 1. Agreement, clauses, limitations of proposal 2. Procedures, methodology, outcome of proposals 3. Dissemination, evaluation criteria 4. Pre-Qualification of proposal 5. Problem definition, presenting solutions	2

	6. Deliverables and success criteria 7. Cost/Budget 8. Work Scope planning 9. Work scope procurement options 10. Works Construction Method statement 11. Work scope integration planning 12. Role of chief planner 13. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	
Week 3	**Developing Project Construction Time Schedule** 1. Data Collection (research) 2. Compliance with state and local laws of proposals 3. Meetings with the prospective client 4. Tying all elements together 5. References 6. . Edit and proof reading of proposal 7. . Review and Award of Contract 8. . Defining Project Activities 9. .Work Breakdown System (WBS) 10. .Activities identification, estimation and duration 11. .Establishing the correlation b/w activities on basis of cost and quantities 12. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	3,4,5
Week 4	**CPM/PERT Analysis** 1. Fundamentals of CPM Network analysis 2. PERT Network modeling analysis 3. PERT/CPM 4. Plotting the project cost time function 5. Time Crashing (Cost Crashing)	3,5

	6. Quiz 7. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	
Week 5	**Precedence Network Analysis** 1. Precedence network analysis fundamentals 2. Network development procedure 3. Classification of Network 4. Guidelines for drawing precedence network 5. Precedence network analysis Vs CPM 6. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	4
Week 6	**Scheduling Project Work & Resources** 1. Work Scheduling Fundamentals 2. Bar Chart Method for work scheduling of simple projects 3. Resource Scheduling considerations 4. Schedule Hierarchy 5. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	1 & 4
Week 7	**Planning Construction Manpower** 1. Structuring construction site operational units 2. Classifying construction site workers 3. Estimating direct workers of an activity **4.** Scheduling construction site workers **5.** Organizing project manpower **6.** **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	2
Week 8	**Mid Term Test**	
Week 9	**Planning Construction Materials** 1. Fundamentals of material classification	1

	2. Material wastage standard and provisioning process and inventory 3. Inventory planning process 4. Application of value engineering in procurement of materials 5. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	
Week 10	**Project Construction Equipment and their selection** 1. Classification of major equipment 2. Earth excavating, cutting and hauling equipment 3. Earth compaction and grading equipment 4. Concrete plant 5. Cranes for material handling 6. Task, cost and engineering consideration 7. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	1
Week 11	**Planning Construction Cost & Budget Allocation** 1. Method of estimating project cost 2. Planning resources unit rate 3. Planning work package standard cost and earned value of work package 4. Project Time-Phase Baseline development 5. Cost Control Approach & project direct & indirect cost control 6. Budget Cost Control 7. Earned value management system 8. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	1 & 3
Week 12	**Controlling project time schedule** 1. Time Progress monitoring methods 2. What if analysis	2

	3. Time Reduction techniques 4. Critical project chain management 5. Guideline for reviewing time progress 6. Quiz Test 7. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	
Week 13	**Risk Management at Construction Site** 1. Risk definition 2. Project risk management strategy development 3. Risk identification and assessment approach 4. Quantifying the risk 5. Risk mitigation and allocation 6. Human side of risk management 7. Benefits of managing project risk 8. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	4
Week 14	**Project Management Information System (PMIS)** 1. Importance of information in project context, 2. Software use in (PMIS), 3. Benefit of project information system, 4. Tools and techniques used in PMIS, 5. Project documents Management, 6. **Course Review** 7. **Lab: Capstone Project:** Application of topics covered in class to the Capstone Project.	1 thru 5
Week 15	**Final Test / Final Project** (Submission & Presentations)	

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