INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

CIVIL ENGINEERING

COURSE DESCRIPTOR

Course Title	**COST MANAGEMENT OF ENGINEERING PROJECTS**				
Course Code	**BCSB28**				
Programme	**M. Tech (STE)**				
Semester	**III**				
Course Type	**Open Elective**				
Regulation	**IARE - R18**				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	3	**-**	**3**	**-**	**-**
Course Faculty	**Mr. Gude Ramakrishna, Associate Professor**				

I. COURSE OVERVIEW:

The Cost Management of Engineering Project offers a comprehensive and systematic introduction to the basic principles and basic approach of the project cost management as well as the application in engineering practice. The main content includes the outline of project cost management, project cost forecasts, project cost plan, project cost control, cost accounting, cost analysis, project cost assessment, responsibility cost management, financing cost management, procurement cost management and quality cost management. Scope, time, and cost management are at the heart of successful project management. This course will give you the tools to develop a project scope, schedule and budget and then status them to predict project performance. Throughout the course, you will learn about change management and techniques to implement it.

II. COURSE PRE-REQUISITES:

Level	Course Code	Semester	Prerequisites	Credits
PG	-	-	Management and Organization Behavior	-

III. MARKSDISTRIBUTION:

Subject	SEE Examination	CIA Examination	Total Marks
Cost management of engineering projects	70 Marks	30 Marks	100

IV. DELIVERY / INSTRUCTIONAL METHODOLOGIES:

✘	CHALK & TALK	✘	QUIZ	✔	ASSIGNMENTS	✘	MOOCS
✔	LCD / PPT	✘	SEMINARS	✘	MINI PROJECT	✔	VIDEOS
✘	OPEN ENDED EXPERIMENTS						

V. EVALUATION METHODOLOGY:

The course will be evaluated for a total of 100 marks, with 30 marks for Continuous Internal Assessment (CIA) and 70 marks for Semester End Examination (SEE). Out of 30 marks allotted for CIA during the semester, marks are awarded by taking average of two CIA examinations or the marks scored in the make-up examination.

Semester End Examination (SEE): The SEE is conducted for 70 marks of 3 hours duration. The syllabus for the theory courses is divided into five modules and each module carries equal weightage in terms of marks distribution. The question paper pattern is as follows. Two full questions with "either" or "choice" will be drawn from each module. Each question carries 14 marks. There could be a maximum of two sub divisions in a question.

The emphasis on the questions is broadly based on the following criteria:

50 %	To test the objectiveness of the concept.
50 %	To test the analytical skill of the concept OR to test the application skill of the concept.

Continuous Internal Assessment (CIA):

CIA is conducted for a total of 30 marks (Table 1), with 25 marks for Continuous Internal Examination (CIE), 05 marks for Technical Seminar and Term Paper.

Table 1: Assessment pattern for CIA

Component	Theory		Total Marks
Type of Assessment	CIE Exam	Technical Seminar and Term Paper	
CIA Marks	25	05	30

Continuous Internal Examination (CIE):

Two CIE exams shall be conducted at the end of the 9th and 17th week of the semester respectively. The CIE exam is conducted for 25 marks of 2 hours duration, consisting of 5 one mark compulsory questions in part-A and 4 questions in part-B. The student has to answer any 4 questions out of five questions, each carries 5 marks. Marks are awarded by taking average of marks scored in two CIE exams.

Technical Seminar and Term Paper:

Two seminar presentations and the term paper with overview of topic are conducted during II semester. The evaluation of technical seminar and term paper is for maximum of 5 marks. Marks are awarded by taking average of marks scored in two Seminar Evaluations.

VI. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes		Strength	Proficiency assessed by
PO3	Capable to apply the core, multidisciplinary knowledge for understanding the problems in structural engineering and allied fields.	2	Assignments, Tutorials
PO5	Able to identify and analyze the impact of Structural Engineering in development projects and find a suitable solution from number of alternatives.	2	Assignments
PO6	Conceptualize and design civil engineering structures considering various socio-economic factors.	2	Assignments
PO7	Ability to demonstrate in-depth knowledge of Structural Engineering and build capability to apply that knowledge to real problems.	3	Assignments / Seminar

3 = High; 2 = Medium; 1 = Low

VII. COURSE OBJECTIVES (COs):

The course should enable the students to:	
I	Establish systems to help streamline the transactions between corporate support departments and the operating units.
II	Devise transfer pricing systems to coordinate the buyer-supplier interactions between decentralized organizational operating units.
III	Use pseudo profit centers to create profit maximizing behavior in what were formerly cost centers.

VIII. COURSE OUTCOMES (COs):

COs	Course Outcomes	CLOs	Course Learning Outcome
CO 1	Understand the concept of strategic cost management, strategic cost analysis–target costing, life cycle costing and Kaizen costing and the cost drive concept.	CLO 1	Understand the concept of strategic cost management.
		CLO 2	Understand the concept of strategic cost analysis - target costing, life cycle costing & Kaizen costing.
		CLO3	Analyze the decision making and pricing strategies.
		CLO 4	Understand the concept of cost concepts in decision-making; relevant cost, differential cost, incremental cost and opportunity cost.
CO 2	Describe the decision-making; relevant cost, differential cost, incremental cost and opportunity cost, objectives of a costing system.	CLO 5	Determination of costing system and inventory valuation.
		CLO 6	Creation of a database for operational control.
		CLO 7	Analyze the provision of data for decision making.
		CLO 8	Understand the project meaning, different types, why to manage cost overruns centers, and various stages of project execution.
CO 3	Describe the decision-making; relevant cost, differential cost, incremental cost and opportunity cost, objectives of a costing system.	CLO 9	Analyze the conception to commissioning. Project execution as conglomeration of technical and nontechnical activities.
		CLO 10	Able to analyze the detailed engineering activities. Pre project execution main clearances and documents.
		CLO 11	Understand the data required with significance and project contracts.
		CLO 12	Understand the project contracts. Types and contents, project execution, project cost control, bar charts and network diagram, project commissioning.
CO 4	Understand the project contracts, cost behavior and profit planning types and contents, Bar charts and Network diagram.	CLO 13	Understand the behavior and profit planning marginal costing, distinction between marginal costing and absorption costing, break-even analysis.
		CLO 14	Understand the material requirement, planning, enterprise resource planning, total quality management and theory of constraints.
		CLO 15	Understand the thermal, flexible budgets, performance budgets zero-based budgets, measurement of divisional profitability pricing decisions including transfer pricing.

COs	Course Outcomes	CLOs	Course Learning Outcome
		CLO 16	Analyze quantitative techniques for cost management.
CO 5	Analyze by using quantitative techniques for cost management like PERT/CPM.	CLO 17	Analyze the linear programming, PERT/CPM, transportation problems.
		CLO 18	Analyze the simulation, learning curve theory.

IX. COURSE LEARNING OUTCOMES (CLOs):

CLO Code	CLO's	At the end of the course, the student will have the ability to:	PO's Mapped	Strength of Mapping
BCSB28.01	CLO 1	Understand the concept of strategic cost management	PO 3, PO7	3
BCSB28.02	CLO 2	Understand the concept of strategic cost Management	PO 3, PO7	2
BCSB28.03	CLO 3	Understand the concept of Strategic Cost Analysis - Target Costing, Life Cycle Costing & Kaizen Costing	PO 3	2
BCSB28.04	CLO 4	Analyze the decision Making and Pricing Strategies	PO 3,PO 5, PO 6,PO 7	3
BCSB28.05	CLO 5	Understand the concept of cost concepts in decision-making; Relevant cost, Differential cost, Incremental cost and Opportunity cost.	PO 3,PO 5, PO 6,PO 7	3
BCSB28.06	CLO 6	Determination of Costing System and Inventory valuation.	PO 5	2
BCSB28.07	CLO 7	Creation of a Database for operational control.	PO 5	2
BCSB28.08	CLO 8	Analyse the provision of data for decision making.	PO 6,PO 7	3
BCSB28.09	CLO 9	Understand the Project: meaning, Different types, why to manage, cost overruns centers, various stages of project execution	PO 6	2
BCSB28.10	CLO 10	Analyze the conception to commissioning. Project execution as conglomeration of technical and nontechnical activities	PO 6,PO 7	2
BCSB28.11	CLO 11	Able to analyze the detailed Engineering activities. Pre project execution main clearances and documents	PO 6,PO 7	3
BCSB28.12	CLO 12	Understand the data required with significance and Project contracts	PO 6	3

BCSB28.13	CLO 13	Understand the Project contracts. Types and contents. Project execution Project cost control. Bar charts and Network diagram. Project commissioning:	PO 7	3
BCSB28.14	CLO 14	Understand the behavior and Profit Planning marginal Costing;, distinction between marginal costing and absorption costing; Break-even Analysis,	PO 7	3
BCSB28.15	CLO 15	Understand the material requirement, planning, enterprise resource planning, Total quality management and Theory of constraints.	PO 6,PO 7	3
BCSB28.16	CLO 16	Understand the thermal; Flexible Budgets; Performance budgets; Zero-based budgets. Measurement of Divisional profitability pricing decisions including transfer pricing	PO 7	3
BCSB28.17	CLO 17	Analyze Quantitative techniques for cost management	PO 5, PO 7	3
BCSB28.18	CLO 18	Able to analyze the Linear Programming, PERT/CPM, Transportation Problems	PO 3,PO 5, PO 6,PO 7	3

3 = High; 2 = Medium; 1 = Low

XII. MAPPING COURSE OBJECTIVES LEADING TO THE CHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES:

COURSE OBJECTIVES	PROGRAM OUTCOMES			
	PO3	PO5	PO6	PO7
CO 1	2	2	3	3
CO 2		2	2	
CO 3	2	1		3
CO 4	2	2	2	3
CO 5	2	1		3

3 = High; 2 = Medium; 1 = Low

XIII. MAPPING COURSE LEARNING OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES:

(CLOs)	Program Outcomes						
	PO 1	PO2	PO3	PO4	PO5	PO6	PO7
CLO 1			2				3
CLO 2			2				2
			2				3

CLO 3							
CLO 4			3	3	3	3	3
CLO 5			3	3	3	3	3
CLO 6						2	
CLO 7					2		
CLO 8						3	3
CLO 9						2	
CLO 10						2	2
CLO 11						3	3
CLO 12						2	
CLO 13							3
CLO 14							3
CLO 15						3	3
CLO 16							3
CLO 17					3		3
CLO 18				3	3	3	3

3= High; 2 = Medium; 1 = Low

XIV. ASSESSMENT METHODOLOGIES – DIRECT

CIE Exams	PO 3, PO 4 , PO5, PO6, PO7	SEE xams	PO 3, PO 4 , PO5, PO6, PO7	Seminars and term paper	PO 6
VIVA	-	Student Viva	-	Mini Project	-

XV. ASSESMENT METHODOLOGIES – INDIRECT

✔	Early Semester Feedback	✔	End Semester OBE Feedback
✘	Assessment of Mini Projects by Experts		

XVI. SYLLABUS

UNIT – I	**INTRODUCTION**
Introduction and Overview of the Strategic Cost Management Process	
UNIT – II	**COST CONCEPTS**

Cost concepts in decision-making; Relevant cost, Differential cost, Incremental cost and Opportunity cost. Objectives of a Costing System; Inventory valuation; Creation of a Database for operational control; Provision of data for Decision Making.	
UNIT – III	**PROJECT MANAGEMENT**
Project: meaning, Different types, why to manage, cost overruns centers, various stages of project execution: conception to commissioning. Project execution as conglomeration of technical and nontechnical activities. Detailed Engineering activities. Pre project execution main clearances and documents. Project team: Role of each member. Importance Project site: Data required with significance. Project contracts. Types and contents. Project execution Project cost control. Bar charts and Network diagram. Project commissioning: mechanical and process.	
UNIT – IV	**COST BEHAVIOR AND PROFIT PLANNING**
Cost Behavior and Profit Planning Marginal Costing; Distinction between Marginal Costing and Absorption Costing; Break-even Analysis, Cost-Volume-Profit Analysis. Various decision-making problems. Standard Costing and Variance Analysis. Pricing strategies: Pareto Analysis. Target costing, Life Cycle Costing. Costing of service sector. Just-in-time approach, Material Requirement, Planning, Enterprise Resource Planning, Total Quality Management and Theory of constraints. Activity-Based Cost Management, Bench Marking; Balanced Score Card and Value-Chain Analysis. Budgetary Control; Flexible Budgets; Performance budgets; Zero-based budgets. Measurement of Divisional profitability pricing decisions including transfer pricing.	
UNIT – V	**QUANTITATIVE TECHNIQUES**
Quantitative techniques for cost management, Linear Programming, PERT/CPM, Transportation Problems, Assignment problems, Simulation, Learning Curve Theory.	
Text Books:	
1. Robert S Kaplan Anthony A. Alkinson, Management & Cost Accounting. 2. N.D. Vohra, Quantitative Techniques in Management, Tata McGraw Hill Book Co. Ltd.	
Reference Books:	
1. Cost Accounting A Managerial Emphasis, Prentice Hall of India, New Delhi. 2. Charles T. Horngren and George Foster Advanced Management Accounting. 3. Ashish K. Bhattacharya, Principles & Practices of Cost Accounting A. H. Wheeler publisher.	

XVII. COURSE PLAN:

The course plan is meant as a guideline. Probably there may be changes.

Lecture No	Topics to be covered	Course Learning Outcomes (CLOs)	Reference
1	Introduction and Overview of the Strategic Cost Management Process	Understand the Concept of strategic Cost Management	T1:3.1
2-3	Overview of the Strategic Cost Management	Understanding Strategic Cost Analysis - Target Costing, Life Cycle Costing & Kaizen Costing.	T1:3.9
4	Overview of the Strategic Cost Management	Explain about Business Process Re-engineering	T1:3.3
5-6	Cost Control and Reduction.	Explain the cost Control and Reduction.	T1:3.4
7	Decision Making and Pricing Strategies	Study about Decision Making and Pricing Strategies	T1:3.4

8	Strategic Cost Management Process	Study about r elevant Cost Analysis	T1:3.7
9	Strategic Cost Management Process	Understand the Cost concepts in decision-making	T1:2.7
10-11	Cost concepts in decision-making; Relevant cost	Explain about Relevant cost, Differential cost,	T1:2.9
12	Cost concepts in decision-making; Relevant cost	Explain about Objectives of a Costing System.	T1:2.9
13-14	Differential cost, Incremental cost and Opportunity cost	Explain about Inventory valuation	T1:6.2, 6.12
15	Differential cost, Incremental cost and Opportunity cost	Explain Creation of a Database for operational control	T1:6.8
16	Objectives of a Costing System	Explain Provision of data for Decision Making	T1:6.4
17-18	Database for operational control	Explain about meaning, Different types, why to manage	T1:6.9
19	Project: meaning, Different types, why to manage, cost overruns centers, various stages of project execution	Explain the various types cost overruns centers, various stages of project execution	T1:5.1,5.2
20-21	Conception to commissioning	Explain about conception to commissioning	T1:5.1,5.2
22	Project execution as Conglomeration of technical and nontechnical activities	Explain the Project execution as conglomeration of technical activities	T1:5.9
23	Detailed Engineering activities..	Explain Project execution as conglomeration of nontechnical activities.	T1:5.3,5.4
24-25	Project execution Project cost control. Bar charts and Network diagram	Explain Pre project execution main clearances and documents. and Network diagram..	T1:10
26-27	Project commissioning: mechanical and process.	Explain Project commissioning	T1:10.17
29	Cost Behavior and Profit Planning Marginal Costing	Explain the Cost Behavior and Profit Planning Marginal Costing	T2:9.1
30	Distinction between Marginal Costing and Absorption Costing	Explain the Distinction between Marginal Costing and Absorption Costing	T2:12
31	Break-even Analysis, Cost-Volume-Profit Analysis. Various decision-making problems. Standard Costing and Variance Analysis.	Explain the Cost Behavior and Profit Planning Marginal Costing	T2:13
32	Total Quality Management and Theory of constraints	Explain the Distinction between Marginal Costing and Absorption Costing	T2:13.1
33-34	Standard Costing and Variance Analysis	Explain Break-even Analysis, Cost-Volume-Profit Analysis	T2:13
35	Pareto Analysis. Target costing, Life Cycle Costing. Costing of service sector	Explain Various decision-making problems.	T2:9.2
36	Performance budgets; Zero-based budgets. Measurement of Divisional profitability	Explain Standard Costing and Variance Analysis.	T1:4.4
37	Quantitative techniques for cost management	Explain Pricing strategies: Pareto Analysis.	T1:4.8
38-39	Quantitative techniques for cost management	Understand the Target costing and Life Cycle Costing	T1:4.14, 4.17
40	Quantitative techniques for cost management	Explain Types Material Requirement, Planning, Enterprise Resource	T2:11

		Planning	
41	Management transportation problems	Explain Activity-Based Cost Management; Balanced Score Card and Value-Chain Analysis	T2:8
42	Linear Programming, PERT/CPM,	Explain the Quantitative techniques for cost management	T2:8
43-44	Linear Programming, PERT/CPM,	Explain Linear Programming, PERT/CPM	T2:9
45	Problems on simulation	Explain about Transportation Problems	T2:14
46	Problems on simulation	Explain solving assignment problems	T2:15
47	Decision Making and Pricing Strategies	Explain about Simulation	T2:17
48	Decision Making and Pricing Strategies	Explain the Learning Curve Theory.	T2:18

Students, who complete the course, will have demonstrated the ability to do the following:

BCSB28 .01	Understand the concept of Strategic Cost Management
BCSB28 .02	Understand the concept of Strategic Cost Analysis - Target Costing, Life Cycle Costing & Kaizen Costing
BCSB28 .03	Analyze the decision Making and Pricing Strategies
BCSB28 .04	Understand the concept of cost concepts in decision-making; Relevant cost, Differential cost, Incremental cost and Opportunity cost.
BCSB28 .05	Determination of Costing System and Inventory valuation.
BCSB28 .06	Creation of a Database for operational control.
BCSB28 .07	Analyse the provision of data for decision making.
BCSB28 .08	Understand the Project: meaning, Different types, why to manage, cost overruns centers, various stages of project execution
BCSB28 .09	Analyze the conception to commissioning. Project execution as conglomeration of technical and nontechnical activities
BCSB28 .10	Able to analyze the Detailed Engineering activities. Pre project execution main clearances and documents
BCSB28 .11	Understand the data required with significance and project contracts
BCSB28 .12	Understand the Project contracts. Project execution, project cost control. Bar charts, network diagram and Project commissioning.
BCSB28 .13	Understand the behavior of profit planning, marginal costing, distinction between marginal costing and absorption costing, break-even analysis
BCSB28 .14	Understand the material requirement, planning, enterprise resource planning, total quality management and theory of constraints.
BCSB28 .15	Understand the thermal, flexible budgets, performance budgets, zero-based budgets. Measurement of divisional profitability pricing decisions including transfer pricing
BCSB28 .16	Analyze quantitative techniques for cost management
BCSB28 .17	Able to analyze the linear Programming, PERT/CPM, Transportation Problems
BCSB28 .18	Able to analyze the simulation, learning Curve Theory

XVIII. GAPS IN THE SYLLABUS - TO MEET INDUSTRY / PROFESSION REQUIREMENTS:

S. No.	Description	Proposed actions	Relevance with POs
1	Knowledge of project execution as conglomeration of technical activities tests.	Seminars/Guest Lectures/NPTEL	PO 3
2	Linear programming for PERT and CPM	Seminars/Guest Lectures/NPTEL	PO 7

Prepared by:

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