SCHOOL OF STEM SYLLABUS

TERM:

INSTRUCTOR:

COURSE CODE: CNM-225

OFFICE HOURS:

COURSE TITLE: Cost Estimation

OFFICE LOCATION:

DAY(S) AND TIME(S):

EMAIL:

LOCATION:

PHONE:

COURSE PREREQUISITE: None

CREDITS: 4

COURSE DESCRIPTION:

Students acquire a basic understanding of managing a project's cost in association with reading and interpreting construction blueprints. The course introduces the types of cost estimation from the conceptual design phase through the more detailed design phase of a construction project. In addition, the course highlights the importance of controlling costs and how to monitor project cash flow. Students develop a break-even analysis of construction tasks in a project.

STUDENT LEARNING OUTCOMES:

Upon successful course completion, students will be able to:

1. Develop the skills to understand and interpret the blueprints.
2. Identify key components of blueprints that are crucial in cost estimation.
3. Apply different methods of cost estimation with respect to their uses in the construction industry.
4. Calculate the costs of products and services.
5. Analyze different kinds of costs & expenses.
6. Interpret drawings and contract documents.
7. Determine quantities of materials from contract plans and specifications.
8. Estimate economic risks involved in decision making.

TEXTBOOK AND SUPPLEMENTAL MATERIALS:

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

a) Estimating Construction Cost, Robert L. Peurifoy & Gerold D. Oberlender, 6th Edition; ISBN# 978-0-07-339801-3
b) AASHTO Practical Guide to Cost Estimating- Part I

GRADING POLICY:

Attendance and Participation	**5%**
Homework	**15%**
Quizzes	**5%**
Midterm	**30%**
Final Exam	**30%**
Case Study	**15%**

SAMPLE COURSE SCHEDULE:

Schedule	**Lecture Topic**	Student Learning Objectives (SLO)
Session 1	Orientation, description of course intent, schedule, expectation from students **Introduction to cost estimation & Bid Documents & blueprint reading and understanding** 1. Basics of blueprints 2. Types of drawings 3. Components of blueprints (parts of blueprint) 4. Types of views in blueprints 5. Types of different lines in blueprints 6. Interpreting Symbols and specs. 7. Understanding blueprints 8. Title block, revision block, notes & legends 9. Role of estimation in construction industry 10. Types of cost estimates	1, 2, 4,

	11. Types of contracts, methods of cost estimations 12. Estimating and construction safety	
Session 2	**Estimating Process and Preliminary Procedures** 1. Estimating Process 2. Bidding Process 3. Contract's bidding documents 4. Site Visit 5. Introduce Case Study (Project Assignment) 6. Group Formation	1, 4, 6, 7
Session 3	**Estimating Labor and Equipment Cost** 1. Labor rates, applicable taxes, Insurances and fringe benefits 2. Renting Vs Owning of equipment 3. Equipment cost and their depreciation 4. Investment Cost 5. Equipment cost and operating costs	3,6,7
Session 4	**Excavation, handling and transportation** 1. Earthwork, sand and aggregate transportation 2. Pipes, Lumber and other precast and fabricated material's transportation 3. Equipment used for material transportation 4. Various excavation methods, types of equipment used and calculating the rates 5. Drilling and blasting 6. Cost calculation **7. Quiz**	1, 3, 5
Session 5	**Highways and Pavements** 1. Clearing, Grubbing, demolition and disposal 2. Concrete pavements, construction method 3. Placing, finishing and curing of concrete	3, 5

	4. Asphalt pavement, plants, aggregate 5. Asphalt placement and compaction 6. Equipment used 7. Cost calculation	
Session 6	**Foundations** 1. Types, footing, trenching, sheeting 2. Pile, types, driving, 3. Piling, different piling operations, 4. Jetting and putting piles in position 5. Cost calculation	2, 3
Session 7	**Concrete Structures** 1. Cost of Concrete Structures 2. Forming of concrete structures 3. Types of labor trades use in different operations 4. Scaffolds 5. Reinforcing steel 6. Types of reinforcement, placement, labor and equipment use 7. Cost of reinforcement	2, 3
Session 8	**Mid Term Test**	
Session 9	**Steel Structures** 1. Types of steel structure, type of material 2. Estimating the weight of steel 3. Connections required for steel structures 4. Estimating the cost of steel structures 5. Cost of preparing shop drawings 6. Fabrication cost 7. Required offsite inspections 8. Erection, installation, field painting	3, 5

	9. Cost of labor and equipment	
Session 10	**Carpentry, Roofing Flashing & Masonry** 1. Types of lumber and accessories used for installation 2. House framing and its components 3. Rafters, trusses, and decking 4. Exterior carpentry, doors, windows and wall paneling 5. Roofing, shingles, built up roofing 6. Flashing, types, labor 7. Masonry, concrete and stone masonry, estimating cost of masonry 8. Type of Joints, mortar, estimating mortar, 9. Bricks, types size quantity estimation, laying cost of bricks	5, 8
Session 11	**Floor System Finishes and Painting** 1. Floor systems, steel joist system, reinforcement for steel floor system 2. Materials, application rate, 3. Surface preparation 4. Labor and equipment use 5. Cost estimation **6. Quiz** **7. Review case study; progress report**	5, 8
Session 12	**Plumbing & Electrical Wiring** 1. Plumbing requirement and compliance with the code 2. Type of Piping system, fittings, valves and traps 3. Rough plumbing, cost of roughing 4. Finish plumbing, cost of finishing 5. Installation of fixtures, labor required 6. Factor affect cost of wiring	3, 5

	7. Item included in cost of wiring 8. Rough electrical work, and its cost 9. Finish electrical work and its cost	
Session 13	**Sewerage & Water distribution system** 1. Sewer Pipe, construction operation 2. Trenchless technology and its cost estimation 3. Water distribution system and its cost 4. Valves, service lines and fire hydrants 5. Testing of water pipes 6. Labor and equipment required for laying water pipes 7. Cost of water distribution system	3, 5
Session 14	Case Study Presentation (Project Presentation)	
Session 15	**Final Exam**	

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