CM.CE 541 – Project Management in Construction Engineering

Syllabus:

Part A:

- Optimization & Linear Programming; Simplex Method; unit price proposal; pricing for constructed facilities; cost of construction contracts
- Competitive bidding; Bidding Strategy based on probabilistic measure
- Cost estimation; effects of scale on construction
- Cost associated with constructed facilities.
- Cost Indices; application to cost estimating
- Construction costs over time
- Economic evaluation of construction projects; evaluation of alternative financing Plans; financing feasibility of construction project; minimum acceptable rate of return; Cost-Benefit Ratio
- Uncertainty and risk in financing projects
- Construction financing for contractors

Part B:

- Requirements for construction scheduling
- Simplified construction scheduling
- Network scheduling and types.
- Probabilistic analysis of Activity Duration
- Construction Scheduling as Linear Programming
- Critical Path Method (CPM) in construction management
- CMP diagrams & Calculations.
- Floats & CPM Calculations
- Uncertainty of construction planning; expected values
- PERT (Program Evaluation Review Technique) - probabilistic scheduling
- PERT vs CPM - evaluation
- Introduction to Monte Carlo Method

Reference texts:

1. O'Brien, James, *CPM in Construction Management*, 3rd ed., McGraw-Hill,N.Y.,1984.
2. Stevens, S. D., *Techniques for Construction Network Scheduling*, McGraw-Hill,N.Y.,1990.

3. Iannone, A.L.,& Civitello, A. M., *Construction Scheduling Simplified*, Prentice-Hall,1985.
4. Hendrickson, C., & Au, T. , *Project-Management for Construction*, Prentice-Hall, 1989.
5. Courtland, A.C.,& Halpern, D.A., *Construction Funding*, John Wiley, 1984