

### PROJECT SCHEDULING

Time is an important criterion for job control. If a project is to proceed efficiently and be completed within the contract time, the work must be carefully planned and scheduled in advance. Specifically, in a large project with many mutually dependent and interrelated operations wherein each task has its own time, materials, equipment, and labor requirements, project planning and scheduling becomes a very complicated and difficult management function.

#### **Course Objectives:**

The primary course objectives are to teach theoretical concepts and practical techniques for planning and scheduling of construction projects and to provide students with the ability to prepare a comprehensive schedule for a project, including bar charts, network diagrams, resource profiles, and time contingency analysis. To obtain a feel for how to approach a real life situation, students will prepare a schedule for a construction project. The project requires students to work in groups of four or five. Upon completion of the course the students should be able to demonstrate competence in the following areas: 1) Identify activities involved in a construction project and their relationships; 2) Develop arrow and precedence network diagrams and perform schedule computation for networks; 3) Identify the resources required in a project and apply techniques for resource allocation and leveling; 4) Perform cost loading and time-cost trade-offs; 5) Explain concepts and techniques for monitoring, evaluating, and controlling project performance (ie. earned value analysis); 6) Explain contractual and legal issues related to scheduling; and 7) Use a scheduling software.

Following is a week-by-week breakdown of the course:

Week 1	Introduction to Project Scheduling; Work Breakdown Structure; Activity Identification; Bar Chart Schedules, Activity on Node Networks; "PRIMAVERA" Scheduling Software Text: Chapters 1, 2, 3 and handouts "PM101: The WBS" and "Advocating a Deliverable-Oriented Work Breakdown Structure"
Week 2	Activity on Arrow Networks; Scheduling Computations; "NetPoint" Scheduling Software Text: Chapter 4
Week 3	Estimating Activity Durations; Schedule Specifications; Introduction to Term Project Text: Chapter 10
Week 4	Precedence Networks; Resource Allocation and Leveling Text: Chapters 5 and 6
Week 5	Reviewing, Analyzing, and Updating the Schedule; Project Progress Measurement Text: Chapters 7 and 9
Week 6	Review and Mid-Term Exam
Week 7	Cost Planning and Scheduling, Schedule Compression and Decompression Text: Chapter 8
Week 8	Lean Scheduling – Last Planner

Week 9	CPM in Dispute Resolution Text: Chapters 13, 14, and handouts
Week 10	Short-Interval Scheduling; Linear Scheduling; PERT Scheduling Text: Chapter 11 Course Project Due
Week 11	Final Exam 6:30-8:30 PM

**Time:** Lecture W 6:30-9:30 PM, Computer Lab: TBA

**Text:** Construction Project Scheduling and Control by Saleh Mubarak, Third Edition, 2015

**Software:** PRIMAVERA P6 and NetPoint (on MPM Lab. Workstations - Room AG45)

**Course Grade:** Homework 20%; Term Project 25%; Mid-Term Exam 20%; Final Exam 30%; participation 5%.

**Instructor:** Dr. Ahmad Hadavi (847-467-3219) - Room A112; a-hadavi@northwestern.edu