

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:

Jan. 4, 2023	Introduction to Project Scheduling; Work Breakdown Structure; Activity Identification; Bar Chart Schedules; Activity on Node Networks; "PRIMAVERA" Scheduling Software Text: Chapters 1, 2, 3, 10, and handouts "PM101: The WBS" and "Advocating a Deliverable-Oriented Work Breakdown Structure"
Jan. 11	Precedence Diagram Method (PDM) Schedules; Arrow Diagram Method (ADM) Schedules; "NetPoint" Scheduling Software Text: Chapters 4 and 5
Jan. 18	Estimating Activity Durations; Schedule Specifications; Introduction to Term Project Text: Chapters 9
Jan. 25	Reviewing, Analyzing, and Updating the Schedule; Project Progress Measurement Text: Chapters 7 and 13
Feb. 1	Cost Planning and Scheduling, Schedule Compression and Decompression Text: Chapters 8
Feb. 8	Resource Allocation and Leveling Text: Chapter 6
Feb. 15	Review and Mid-Term Exam

Feb. 22	Short-Interval Scheduling; Linear Scheduling; PERT Scheduling; Time Management Text: Chapters 11 and 15 Guest Speaker: Jim Rowings, Vice President, Kiewit Corporation
March 1	CPM in Dispute Resolution Text: Chapters 14, 17, and handouts Guest Speaker: Scott Hollingworth, Partner, HKA
March 8	Lean Scheduling – Last Planner Text: Chapter 16 Guest Speaker: Afshan Barshan – Senior Vice President, Skender Construction
March 15	Final Exam 6:30-8:30 PM

Time: Lecture W 6:30-9:30 PM in Tech M345

Text: Construction Project Scheduling and Control by Saleh Mubarak, Fourth Edition, 2019

Software: Oracle PRIMAVERA P6 and NetPoint (on MPM Lab. Room AG45)

Course Grade: Homework 20%; Term Project 25%; Mid-Term Exam 20%; Final Exam 25%; discussion 10%.

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

Academic Integrity Statement

Students in this course are required to comply with the policies found in the booklet, "Academic Integrity at Northwestern University: A Basic Guide". All papers submitted for credit in this course must be submitted electronically unless otherwise instructed by the professor. Your written work may be tested for plagiarized content. For details regarding academic integrity at Northwestern or to download the guide, visit: <https://www.northwestern.edu/provost/policies-procedures/academic-integrity/index.html>

Northwestern University is committed to providing the most accessible learning environment as possible for students with disabilities. Should you anticipate or experience disability-related barriers in the academic setting, please contact AccessibleNU to move forward with the university's established accommodation process (e: accessiblenu@northwestern.edu; p: 847-467-5530). If you already have established accommodations with AccessibleNU, please let me know as soon as possible, preferably within the first two weeks of the term, so we can work together to implement your disability accommodations. Disability information, including academic accommodations, is confidential under the Family Educational Rights and Privacy Act.

COVID-19 Classroom Expectations Statement

Students, faculty, and staff must comply with University expectations regarding appropriate classroom behavior, including those outlined below and in the [COVID-19 Code of Conduct](#). With respect to classroom procedures, this includes:

- Policies regarding masking and social distancing evolve as the public health situation changes. Students are responsible for understanding and complying with current masking, testing, Symptom Tracking, and social distancing requirements.

- In some classes, masking and/or social distancing may be required as a result of an Americans with Disabilities Act (ADA) accommodation for the instructor or a student in the class even when not generally required on campus. In such cases, the instructor will notify the class.

If a student fails to comply with the [COVID-19 Expectations for Students](#) or other University expectations related to COVID-19, the instructor may ask the student to leave the class. The instructor is asked to report the incident to the Office of Community Standards for additional follow-up.

Exceptions to Class Modality

Class sessions for this course will occur in person. Individual students will not be granted permission to attend remotely except as the result of an Americans with Disabilities Act (ADA) accommodation as determined by AccessibleNU.

Maintaining the health of the community remains our priority. If you are experiencing any symptoms of COVID do not attend class and update your Symptom Tracker application right away to connect with Northwestern's Case Management Team for guidance on next steps. Also contact the instructor as soon as possible to arrange to complete coursework.

Students who experience a personal emergency should contact the instructor as soon as possible to arrange to complete coursework.

Should public health recommendations prevent in person class from being held on a given day, the instructor or the university will notify students.

Prohibition of Recording Classes by Students Unauthorized student recording of classroom or other academic activities (including advising sessions or office hours) is prohibited. Unauthorized recording is unethical and may also be a violation of University policy and state law. Students requesting the use of assistive technology as an accommodation should contact [AccessibleNU](#). Unauthorized use of classroom recordings – including distributing or posting them – is also prohibited. Under the University's [Copyright Policy](#), faculty own the copyright to instructional materials – including those resources created specifically for the purposes of instruction, such as syllabi, lectures and lecture notes, and presentations. Students cannot copy, reproduce, display, or distribute these materials. Students who engage in unauthorized recording, unauthorized use of a recording, or unauthorized distribution of instructional materials will be referred to the appropriate University office for follow-up.

Support for Wellness and Mental Health

Northwestern University is committed to supporting the wellness of our students. Student Affairs has multiple resources to support student wellness and mental health. If you are feeling distressed or overwhelmed, please reach out for help. Students can access confidential resources through the Counseling and Psychological Services (CAPS), Religious and Spiritual Life (RSL) and the Center for Awareness, Response and Education (CARE). Additional information on all of the resources mentioned above can be found here:

<https://www.northwestern.edu/counseling/>

<https://www.northwestern.edu/religious-life/>

<https://www.northwestern.edu/care/>