

**UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN  
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING**

**CEE 421 – Construction Planning – Spring 2025**

**Instructor:** Ernest-John Ignacio  
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**Class Hours:** Tuesdays & Thursdays 8:00am to 9:20am (NCEB 1310)  
**Office Hours:** Tuesdays & Thursdays 9:30am to 11:00am (NCEB 2110) Zoom by request  
**Course Websites:** <https://canvas.illinois.edu/courses/56116> (Course Documents)  
mediaspace.org (Lecture Recordings)  
**Prerequisites:** Construction Engineering (CEE 320) or Graduate Student status  
**TA Office Hours:** Hadil Helaly, [hadil@illinois.edu](mailto:hadil@illinois.edu)  
TBD, 3142 NCEB  
Kinda Al Kalal, [alkalal2@illinois.edu](mailto:alkalal2@illinois.edu)  
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**Textbook:**

Hinze, J.W., 2011 “**Construction Planning and Scheduling**” 4<sup>th</sup> edition, Pearson, New Jersey.

**Optional Supplement References:**

R.S. Means Building Construction Cost Data.

**Other References:**

1. Gould, F.E. and Joyce, N.E., 2022 “**Construction Project Management**”, 5<sup>th</sup> edition, Pearson, New Jersey
2. Robertson, G., 2021 “**Essentials of Construction Planning and Scheduling**”, ICE Publishing
3. Mubarak, S.A., 2019 “**Construction Project Scheduling and Control**”, 4<sup>th</sup> edition, John Wiley & Sons, Inc. N.Y.
4. Baldwin, A. and Bordoli, D., 2014 “**A Handbook for Construction Planning and Scheduling**”, 1<sup>st</sup> edition, John Wiley & Sons, Inc. N.Y.

## Course Description

Project definition; scheduling and control models; material, labor, and equipment allocation; optimal schedules; project organization; documentation and reporting systems; and management and control.

### Topics:

#### 1. Introduction

#### 2. Construction Planning:

- Work Breakdown Structure and Activity List
- Estimating Activity Cost and Duration
- Job Logic and Precedence Relationships

#### 3. Construction Scheduling:

- Bar Charts
- Network Scheduling Techniques
- Computer Scheduling (Primavera)
- Project Review Software (NAVISWORKS)
- Uncertainty in Scheduling (PERT)
- Limited Resource Scheduling
- Resource Leveling
- Scheduling of Repetitive Construction
- Line of Balance Scheduling
- Linear Scheduling Method
- Schedule Optimization & Time-Cost Tradeoff Analysis

#### 4. Construction Control:

- Cash Flow Analysis
- Integrated Time and Cost Control

### Grading:

Class Participation	5%	
Homework	10%	
Exam 1*	25%	(Thursday, March 13 <sup>th</sup> , class time)
Exam 2*	30%	(Tuesday, April 16 <sup>th</sup> , class time)
Term Project (Team)	30%	
Term Paper:	Required as 4 <sup>th</sup> credit for students taking the course for 4 credits.	

\*All on-campus students who registered for the ONC section of CEE421 due to a conflict with another class must take both exams with the rest of the on-campus students at the same time and location. You need to make the necessary arrangements with the other course to take these two exams with the rest of the class.