

Civil Engineering Construction Management (CENG 5350)

Term: Fall 2026

Course Times:

- Tuesday and Thursday: 3:30 PM to 4:50 PM
- RBS 1031/ HEC B210

Professor: Dr. Kyudong Kim

Communication: kkim@uttyler.edu or Canvas message

Office Hours: Tuesday 1:00pm – 2:30pm, Wednesday 3:00pm – 4:30pm, or by appointment

Office: RBN 1008

Course Dates: Aug. 24, 2025 – Dec. 12, 2025

Course Overview

This course provides a comprehensive exploration of construction project management, guiding you through the complete project lifecycle—from initial owner feasibility studies to final project completion by contractors. By integrating essential concepts from **construction management** and **engineering economics**, this course offers both theoretical foundations and practical applications that will serve you throughout your career.

Construction projects represent some of the most complex engineering undertakings, requiring seamless integration of technical knowledge, financial analysis, and management skills. This course is designed around the principle that successful construction professionals must understand both the technical "how" and the economic "why" behind project decisions. You will learn to think like both an engineer and a project manager, developing the analytical skills to evaluate technical solutions within realistic economic constraints.

Construction Management Fundamentals	Engineering Economics Applications
• Cost estimating and budget development • Project scheduling and timeline management • Construction administration and documentation • Project control techniques and performance monitoring • Quality assurance and control systems • Safety management and regulatory compliance	• Annual cost analysis methods • Present worth evaluation techniques • Capitalized cost calculations • Rate-of-return analysis and investment decisions

Rather than treating these as separate subjects, you will apply both skill sets simultaneously through realistic scenarios. For example, when evaluating equipment selection, you will calculate both the

operational efficiency (construction management) and the economic lifecycle costs (engineering economics). When developing project schedules, you will consider both technical sequencing requirements and cash flow implications.

This course emphasizes hands-on learning through:

- **Industry Case Studies:** Analysis of actual construction projects ranging from power plant projects to major infrastructure initiatives
- **Team-Based Projects:** Collaborative planning and analysis of construction projects that mirror real workplace dynamics
- **Guest Industry Expertise:** Professional practitioners will share current industry practices and emerging trends

A detailed schedule outlining topics, required readings, and assignment due dates is provided in the Calendar section of this syllabus. This schedule will serve as your roadmap throughout the semester, helping you stay organized and prepared for each class session.

Student Learning Outcomes

After successfully completing this course, you will be able to:

- **Analyze characteristics and challenges of the U.S. construction industry** including market structure, key players, material cost volatility, regulatory environment, and technology impacts.
- **Evaluate construction administration concepts** including project delivery systems, contracting, project control, dispute resolution, safety, and quality assurance by comparing delivery methods, analyzing contract types, implementing control systems, and developing management programs.
- **Calculate earthwork construction problems** involving volumes, material flow, machine power, and equipment cycle times by computing cut/fill volumes, analyzing material factors, determining haul routes, and optimizing equipment selection.
- **Develop building construction estimates** for time, labor, and materials by creating quantity takeoffs, applying costs and productivity rates, and incorporating indirect costs and contingencies.
- **Implement project scheduling and control methodologies** by constructing CPM networks, calculating critical paths and developing resource schedules.
- **Solve engineering economics problems** with compound interest and time value of money by calculating present/future worth, applying interest formulas, and evaluating cash flow patterns.
- **Apply economic equivalence methods** for engineering decision-making by comparing alternatives using present worth and rate of return analysis, and incorporating depreciation.

Course Materials

- **Textbook (Optional):**
 - Construction Management Fundamentals, Second Edition by Knutson, Schexnayder, Fiori, and Mayo, 2009, ISBN 978-0-07-340104-1. (CM)
 - Engineering Economics (Schaum's Outlines), First Edition by Sepulveda, Souder, and Gottfried, 1984, ISBN 0-07-023834-0. (SCH)
 - Basics of Engineering Economy, First Edition by Leland Blank and Anthony Tarquin, 2008, ISBN 978-0-07-340129-4. (BEE)

Course Structure

This course combines interactive lectures with hands-on group projects. Regular attendance is mandatory, and you are expected to actively participate in class discussions and contribute meaningfully to collaborative project work.

- Homework assignments and quizzes reinforce key concepts throughout the semester
- Team project will give you an opportunity to apply project management concepts
- One midterm examination will be administered during regular class periods
- Final examination takes place during the designated finals week

Grading Structure

Content	Percentage %
Professional Practice	5%
Homework	15%
Synthesis Report	20%
Presentation	10%
Mid-term exam	25%
Final exam	25%
Total	100%

Professional Practice

- You must attend **three professional practice meetings** to receive full credit for the professional practice portion of your grade in this course.
- You can attend ASCE, ITE, CMSA, IEEE, ASME, SAE, etc. student chapter meetings or when these student chapters host guest speakers.

- When you attend a meeting, you are expected to **complete the template Word file and take a picture of yourself at the meeting as proof of your attendance.**
- The template can be found on Canvas.

Homework Assignments

- Homework assignments cover all course content, including lectures, textbook readings, and class discussions
- Problems typically involve engineering economics calculations, construction estimating, and project analysis scenarios
- Assignments are due weekly and require 2-4 hours to complete
- Upload assignments to Canvas as a single file in PDF, Photo (e.g., JPG), or Word (e.g., docx)
- Show all work including formulas, calculations, and final answers clearly boxed
- Feel free to collaborate with your peers, but assignments must be submitted individually

Synthesis Report

- Apply course concepts through an 8-10 page synthesis report demonstrating critical thinking and original analysis on topics like economics, project management, or case studies
- Detail timeframe (e.g., topic selection, draft, final submission) will be discussed with instructor

In class presentation

- Consider that you are presenting your contents on the synthesis report in a conference
- Individuals will make an 8 – 10 minute presentation for the findings and analysis at the end of the semester

Exams

- Two exams will be given: Mid-term and Final Exam, comprehensively covering lectures, textbook material, assigned readings, and class discussions
- Format: Closed book - only writing instruments, erasers, and [NCEES-approved calculators](#) allowed
- Content distribution: engineering economics problems, construction management concepts and calculations
- Question types: Multiple choice, calculation problems, short answer/analysis
- Topics announced one week prior in class
- No practice exams provided - use textbook end-of-chapter problems for self-practice

Grading Policies

- Late HW submissions: While homework serves as a learning process rather than purely an evaluation tool, clear deadlines and policies are necessary to ensure fairness for all students and maintain academic structure.
 - 0-24 hours late: 25% deduction of earned grade

- 24-48 hours late: 50% deduction of earned grade
- More than 48 hours late: No credit
- Re-grade Requests: Grade inquiries must be addressed during office hours within **10 days** of grade posting (including holidays). Monitor your grades regularly on Canvas to track your progress throughout the semester.
- For all homework and exam solutions, you must present your work in a clear, organized format that includes:
 - Formulae used in the solution
 - Variable values with proper identification
 - Step-by-step intermediate calculations
 - Final answers with appropriate units
 - A box drawn around your final answer
- Failure to include any of these components will result in point deductions. Proper documentation of your solution process is essential for receiving full credit.
- There will be no makeup work or extra credit allowed/granted at the end or during the semester unless allowed/granted to everyone by the instructor.

AI Policies

- This course encourages responsible AI use that enhances your learning while maintaining academic integrity.
- When you use AI for your work, you have to:
 - **Clearly indicate and cite**, including the specific tool and date of use, when and how you used AI tools in your assignments
 - Always **fact-check AI-generated information** using reliable sources, and **cite those original sources**
 - Ensure your final work **reflects your own understanding and analysis**

DOs	DON'Ts
● Research and brainstorming ● Writing assistance (e.g., grammar check) ● Concept explanation ● Data analysis guidance	● Having AI complete entire assignments ● Submitting AI work without disclosure ● Using AI for exams

Grading Scale

- A - (90% or higher)
- B - (80 - 89%)
- C - (70 - 79%)
- D - (60 - 69%)

→ F - (Below 60%)

A grade of 69 (D) or below will be a failure to complete the course for graduation in the department.

Attendance Policy:

Regularly attending lectures is essential for success in this class. Punctual attendance at all lectures is mandatory.

Calendar of Topics, Readings, and Due Dates

Week #	Date	Class Topic	Readings	HW Assigned	HW Due
Week 1	T 8/25	Course introduction			
	Th 8/27	Foundations of engineering economy	BEE 1		
Week 2	T 9/1	Annual compounding interest	SCH. 1-3		
	Th 9/4	Discrete and continuous compounding	SCH. 4-5	HW 1	
Week 3	T 9/8	Equivalence, present & Future Worth	SCH. 6, 7		
	Th 9/10	Benefit/Cost, MARR	SCH. 8, 9, 10	HW 2	HW 1
Week 4	T 9/15	Depreciation	SCH. 11		
	Th 9/17	Economics assessment	SCH. 1-11	HW 3	HW 2
Week 5	T 9/22	Overview of construction industry	CM. 2		
	Th 9/24	Construction management	CM. 3 (58-62, 89-91)		HW 3
Week 6	T 9/29	Guest Lecture – Tentative			
	Th 10/1	Mid-term review			
Week 7	T 10/6	Mid-term exam			
	Th 10/8	Project delivery systems	CM. 3 (62-67)	HW 4	
Week 8	T 10/13	Construction contract administration	CM. 8		
	Th 10/15	Estimating earthwork construction	CM. 6 (169-183)		HW 4
Week 9	T 10/20	Mass haul, cycle time	CM. 6 (183-196)	HW 5	
	Th 10/22	Machine power/ Equipment selection	CM. 10, 11		
Week 10	T 10/27	Equipment costs	CM. 12		HW 5
	Th 10/29	Equipment quantities, labor, cost	CM. 5, CM. 6 (196-208)	HW 6	
Week 11	T 11/3	Guest Lecture – Tentative			
	Th 11/5	Estimating building projects	CM. 7		HW 6
Week 12	T 11/10	Project scheduling, critical path method	CM. 4		
	Th 11/12			HW 7	
Week 13	T 11/17	Project control, construction safety, quality and productivity	CM 3 (76-89), CM. 4, CM. 15, 16		
	Th 11/19	Final exam review/ team project workshop			HW 7
Week 14	T 11/24	Thanksgiving holidays!			
	Th 11/26				
Week 15	T 12/1	Team project presentation #1			
	Th 12/3	Team project presentation #2			
Final Exam		TBD			

Note: This schedule is tentative and subject to change. Monitor the course page regularly for current deadlines. In case of university closures or extended absences, course schedules and assignments will be adjusted as needed.

Student Resources:

Resources available to UT Tyler Students

- [UT Tyler Counseling Center](#) (available to all students)
- [MySSP App](#) (24/7 access to Student Support Program counseling through phone or chat and online wellness resources available in a variety of languages)
- [Student Assistance and Advocacy Center](#)
- [Military and Veterans Success Center](#) (supports for our military-affiliated students)
- [UT Tyler Patriot Food Pantry](#)
- [UT Tyler Financial Aid and Scholarships](#)
- [UT Tyler Student Business Services](#) (pay or set up payment plans, etc.)
- [UT Tyler Registrar's Office](#)
- [Office of International Programs](#)
- [Title IX Reporting](#)
- [Patriots Engage](#) (available to all students. Get engaged at UT Tyler.)

University Policies and Information

Withdrawing from Class

Students may [withdraw](#) (drop) from this course using the [Withdrawal Portal](#). Withdrawing (dropping) this course can impact your Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please speak with your instructors, consider your options, speak with your advisor, and visit the One-Stop Service Center (STE 230) or email enroll@uttyler.edu to get a complete review of your student account and the possible impacts to withdrawing. We want you to make an informed decision. UT Tyler faculty and staff are here for you and often can provide additional support options or assistance. Make sure to carefully [read the implications for withdrawing from a course and the instructions](#) on using the [Withdrawal portal](#)..

Texas law prohibits students from dropping more than six courses during their entire undergraduate career*. The six courses dropped includes those from other 2-year or 4-year Texas public colleges and universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and Enrollment Services for additional guidance. **CAUTION #1:** Withdrawing before census day does not mean you get a full refund. Please see the [Tuition and Fee Refund Schedule](#). **CAUTION #2:** All international students must check with the [Office of International Programs](#) before withdrawing. All international students are required to enroll full-time for fall and spring terms. **CAUTION #3:** All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. **CAUTION #4:** All veterans or military-affiliated students should consult with the [Military and Veterans Success Center](#).

* Students who began college for the first time before 2007 are exempt from this law.

Artificial Intelligence Statement

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy. Refer to the About This Course section of the UT Tyler Syllabus Module for specific information on appropriate use of AI in your course(s).

Final Exam Policy

Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.

Incomplete Grade Policy

If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade *only when **all** of the following conditions are met:* (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.

The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

Grade Appeal Policy

Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade. A grade appeal should be used when the student thinks the final course grade awarded does not reflect the grades earned on assessments or follow the grading scale as documented in the syllabus. The student should provide

the rationale for the grade appeal and attach supporting document about the grades earned. The form should be sent via email to the faculty member who assigned the grade. The faculty member reviews the rationale and supporting documentation and completes the instruction section of the form. The instructor should return the form to the student, even if a grade change is made at this level. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful actions, appeals may go beyond the Chairperson to the Dean or the Dean's designee of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the [Registrar's Form Library](#).

NOTE: The Grade Appeal Form is different from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA), the University of Texas at Tyler offers accommodations to students with learning, physical, and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler/> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <https://www.uttyler.edu/disability-services>, the SAR office located in the Robert Muntz Library, LIB 460, email saroffice@uttyler.edu, or call 903.566.7079."

Military Affiliated Students

UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your faculty member aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The [Military and Veterans Success Center \(MVSC\)](#) has campus resources for military-affiliated students. The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

Students on an F-1 Visa

To remain in compliance with Federal Regulations requirements you must do the following:

- Traditional face-to-face classes: Attend classes on the regular meeting days/times.
- Hybrid Classes: Attend all face-to-face classes convened by the instructor according to the schedule set for your specific course.

- Online course: Only one online course can count toward your full-time enrollment. Students are expected to be fully engaged and meet all requirements for the online course.

Academic Honesty and Academic Misconduct

The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the [Student Conduct and Discipline policy](#) in the Student Manual Of Operating Procedures (Section 8).

FERPA

UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in [University Policy 5.2.3](#). The course instructor will follow all requirements to protect your confidential information.

Absence for Official University Events or Activities

This course follows the practices related to [Excused Absences for University Events or Activities](#) as noted in the Catalog.

Absence for Religious Holidays

This course follows the practices related to [Excused Absences for Religious Holy Days as noted in the Catalog](#).

Absence for Pregnant Students

This course follows the requirements of Texas Laws SB 412, SB 459, SB 597/HB 1361 to meet the needs of pregnant and parenting students. Part of the supports afforded pregnant students includes excused absences. Faculty who are informed by a student of needing this support should make a referral to the Parenting Student Liaison. NOTE: Students must work with the Parenting Student Liaison in order to receive these supports. Students should reach out to the Parenting Student Liaison at parents@uttyler.edu and also complete the [Pregnant and Parenting Self-Reporting Form](#).

Campus Carry

We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>.