# CE-399: Project Management in Civil Engineering

*Charles V. Shaefer, Jr. School of Engineering & Science*
Spring 2022

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| Instructor: | Dr. Mohammad Ilbeigi |
| Meeting Times: | TBD |
| Classroom Location: | TBD |
| Contact Info: | ABS 226, milbeigi@stevens.edu, 201.216.8048 |
| Office Hours: | TBD |
| Prerequisite(s): | None |
| Corequisite(s): | None |
| Cross-listed with: | None |

## COURSE DESCRIPTION

This course provides students with an overview of fundamental concepts and application of knowledge, skills, tools, and techniques in managing civil engineering projects. The course covers a wide range of topics related to civil engineering project management including project life cycle and organizational structures, project delivery systems, scheduling, cost estimation, project control, financial analysis, contract management, and code of ethics.

## STUDENT LEARNING OUTCOMES

This course provides the students with the critical knowledge and technical expertise to plan, execute, monitor, and control civil engineering projects to meet the project requirements within budget, schedule, and resource constraints. The course aims to prepare undergraduate students for their future engineering and management professions. After successful completion of this course, the students will be able to understand, explain, and analyze the following items in civil engineering projects:

- Project management process
- Project life cycle and organizational structures
- Project delivery systems and stakeholders' roles
- Project scheduling and time management
- Project cost estimation and management
- Project monitoring and control procedures
- Financial and economic analysis
- Financing methods
- Construction contracts, contract law and liabilities
- Code of ethics

## TENTATIVE COURSE SCHEDULE

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| **Week 1** | **Session 1** | Introduction to Civil Engineering Project Management |
| | **Session 2** | Project Management areas of knowledge |
| **Week 2** | **Session 3** | Civil Engineering Project Life Cycle |
| | **Session 4** | Construction Organizational Structure and Project Delivery Methods |
| **Week 3** | **Session 5** | Scheduling in Civil Engineering Projects: Fundamental Concepts |
| | **Session 6** | Scheduling in Civil Engineering Projects: Critical Path Method |
| **Week 4** | **Session 7** | Scheduling in Civil Engineering Projects: AOA and AON Networks |
| | **Session 8** | Scheduling in Civil Engineering Projects: Floats Analysis |
| **Week 5** | **Session 9** | Scheduling in Civil Engineering Projects: Microsoft Project |
| | **Session 10** | Scheduling in Civil Engineering Projects: Progress Monitoring |
| **Week 6** | **Session 11** | Cost Estimation in Civil Engineering Projects: Fundamental Concepts |
| | **Session 12** | Cost Estimation in Civil Engineering Projects: Different Types of Estimate |
| **Week 7** | **Session 13** | Cost Estimation in Civil Engineering Projects: Quantity Takeoff |
| | **Session 14** | Cost Estimation in Civil Engineering Projects: Pricing |
| **Week 8** | **Session 15** | Cost Estimation in Civil Engineering Projects: Computer-Aided Tools |
| | **Session 16** | Cost Estimation in Civil Engineering Projects: Bidding Process |
| **Week 9** | **Session 17** | Civil Engineering Project Control: Earned Value Management |
| | **Session 18** | Midterm Exam |
| **Week 10** | **Session 19** | Financial Analysis and Engineering Economics: Time Value of Money |
| | **Session 20** | Financial Analysis and Engineering Economics: Net Present Value |
| **Week 11** | **Session 21** | Financial Analysis and Engineering Economics: Cash Flow Analysis |
| | **Session 22** | Financial Analysis and Engineering Economics: Internal Rate of Return |
| **Week 12** | **Session 23** | Financial Analysis and Engineering Economics: Inflation, Interest, Depreciation |
| | **Session 24** | Financial Analysis and Engineering Economics: Economic Project Selection |
| **Week 13** | **Session 25** | Financing Methods for Civil Engineering Projects |
| | **Session 26** | Construction Contracts: Contract Law and Liability |
| **Week 14** | **Session 27** | Construction Contracts: Code of Ethics |
| | **Session 28** | Construction Contracts: Licensure and Review of FE Exam |

When appropriate or necessary, the instructor reserves the right to amend, adjust, or deviate from the syllabus anytime during the semester.

Different assignments and lab practices may have different weights and contributions to your final grade. The weights are determined based on the complexity of the assignments and average performance of the students.

The average grade that is automatically calculated on Canvas does not reflect your actual performance and grade. It might be higher or lower than your actual final grade.

## COURSE FORMAT AND STRUCTURE

This course is designed based on a combination of lecture and lab sessions. All assignments should be submitted before the deadline. Students are expected to:

- Attend classes regularly, punctually and conduct themselves professionally at all times
- Study and perform as necessary to obtain passing grades
- Follow directions outlined by instructors or school administrators
- Respect and follow the policies of Stevens Institute of Technology

A student must attend a minimum of 70% of scheduled class sessions to be eligible to pass the class. Any student whose cumulative attendance falls below 70% must request written permission from the instructor. Students may appeal through proper channels.

Plagiarism is defined as taking, and using as one's own, the ideas and writings of another without giving appropriate credit through proper documentation. Providing assistance to a student attempting to cheat or plagiarize is also considered academically dishonest. Disciplinary action for verifiable academic dishonesty will be pursued. See the "Academic Improprieties" section of the Student Handbook, available on Dean of Graduate Academic's webpage for current policies and procedures.

## COURSE MATERIALS

No textbook is required for the course. The instructor will provide handouts, papers, and reports related to each session of the class on Canvas. However, the following references are recommended for further study:

Kerzner, H. (2017). Project management: a systems approach to planning, scheduling, and controlling. John Wiley & Sons.

Project Management Institute (PMI). (2017). A Guide to the Project Management Body of Knowledge (PMBOK® Guide)

Newitt, J. S. (2009). Construction Scheduling Principals and Practices: Second Edition.

Peurifoy, R. and Oberlender, G. (2014). Estimating Construction Costs, 6th edition 6th Edition. Mc Graw Hill.

Newman, D. G., Eschenbach, T., Lavelle, J., and Lewis, N. (2020). Engineering Economic Analysis 14th Edition. Oxford University Press.

## COURSE REQUIREMENTS

The students' evaluation and their final grades will be based on class participation, in-class activities, assignments, and two exams. No late assignment or make-up exam will be accepted without pre-approval of the instructor. The assignments and exams will include both paper-based and applied computer-based questions. It is the students' responsibilities to install Microsoft Project on their personal laptops and bring it to the class.

## GRADING PROCEDURES

Grades will be based on:

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|---|---|
| In-Class Assignments | (20%) |
| Homework | (30%) |
| Midterm Exam | (25%) |
| Final Exam | (25%) |

## ACADEMIC INTEGRITY

**Undergraduate Honor System**

Enrollment into the undergraduate class of Stevens Institute of Technology signifies a student's commitment to the Honor System. Accordingly, the provisions of the Stevens Honor System apply to all undergraduate students in coursework and Honor Board proceedings. It is the responsibility of each student to become acquainted with and to uphold the ideals set forth in the Honor System Constitution. More information about the Honor System including the constitution, bylaws, investigative procedures, and the penalty matrix can be found online at http://web.stevens.edu/honor/

The following pledge shall be written in full and signed by every student on all submitted work (including, but not limited to, homework, projects, lab reports, code, quizzes and exams) that is

assigned by the course instructor. No work shall be graded unless the pledge is written in full and signed.

**"*I pledge my honor that I have abided by the Stevens Honor System*."**

Reporting Honor System Violations
Students who believe a violation of the Honor System has been committed should report it within ten business days of the suspected violation. Students have the option to remain anonymous and can report violations online at www.stevens.edu/honor.

**Graduate Student Code of Academic Integrity**

*All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student's submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.*

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at www.stevens.edu/provost/graduate-academics.

**Special Provisions for Undergraduate Students in 500-level Courses**

The general provisions of the Stevens Honor System do not apply fully to graduate courses, 500 level or otherwise. Any student who wishes to report an undergraduate for a violation in a 500-level course shall submit the report to the Honor Board following the protocol for undergraduate courses, and an investigation will be conducted following the same process for an appeal on false accusation described in Section 8.04 of the Bylaws of the Honor System. Any student who wishes to report a graduate student may submit the report to the Dean of Graduate Academics or to the Honor Board, who will refer the report to the Dean. The Honor Board Chairman will give the Dean of Graduate Academics weekly updates on the progress of any casework relating to 500-level courses. For more information about the scope, penalties, and procedures pertaining to undergraduate students in 500-level courses, see Section 9 of the Bylaws of the Honor System document, located on the Honor Board website.

## EXAM ROOM CONDITIONS

The following procedures apply to exams for this course. As the instructor, I reserve the right to modify any conditions set forth below by printing revised Exam Room Conditions on the exam.

1. Students may use the following devices during quizzes and/or exams. Any electronic devices that are not mentioned in the list below are not permitted.

| **Device** | **Permitted?** | |
|---|---|---|
| | Yes | No |
| Laptops | X | |
| Cell Phones | | X |
| Tablets | X | |
| Smart Watches | | X |
| Google Glass | | X |

2. Students may use the following materials during exams. Any materials that are not mentioned in the list below are not permitted.

| **Material** | **Permitted?** | |
|---|---|---|
| | Yes | No |
| Handwritten Notes | X | |
| Typed Notes | X | |
| Textbooks | X | |
| Readings | X | |

3. Students are not allowed to work with or talk to other students during exams.

# LEARNING ACCOMODATIONS

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

*Disability Services Confidentiality Policy*

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/office-disability-services. If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at pgehman@stevens.edu or by phone (201) 216-3748.

# INCLUSIVITY

***Name and Pronoun Usage***

As this course includes group work and in-class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

***Inclusion Statement***

Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

# MENTAL HEALTH RESOURCES

Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues

(e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression). Appointments are strongly encouraged and can be made by phone (201-216-5177) or in-person (on the 7th floor of the Howe Center). CAPS is open from 9:00 am – 5:00 pm Mondays, Wednesdays, Thursdays and Fridays and from 9:00 am – 7:00 pm on Tuesdays during the Fall and Spring semesters.

## EMERGENCY INFORMATION

In the event of an urgent or emergent concern about the safety of yourself or someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year round. Other 24/7 resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text “Home” to 741-741). If you are concerned about the wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at care@stevens.edu. A member of the CARE Team will respond to your concern as soon as possible.