Copilot

CIVL460 - Transportation Engineering Design Project

University: Central Technical University

Course Duration: Full Year (Fall 2023 & Winter 2024)

Instructor: Dr. Robert Williams

Contact Information: robert.williams@ctu.edu

Office Hours: Tuesdays and Thursdays, 2:00 PM - 4:00 PM

COURSE INFORMATION

Class Meeting Schedule: Meets 9/5/2023 through 4/10/2024

Class Meeting Dates: Weekly meetings; Wednesday 10:00 AM - 12:50 PM

Classroom: Engineering Building, Room 201

Course Format: This course includes lectures, hands-on projects, team activities, and presentations.

Materials - Textbooks, Readings, Supplementary Readings

Textbook Required:

- "Principles of Highway Engineering and Traffic Analysis" by Fred L. Mannering, Scott S. Washburn, and Walter P. Kilareski

Software Recommended:

- Microsoft Office - MS Word, Excel, PowerPoint
- Transportation analysis software (e.g., Synchro, VISSIM)
- CAD software (e.g., AutoCAD, Civil 3D)

Course Description

This final-year capstone course involves the design and analysis of a comprehensive transportation engineering project. Students work in teams to tackle a real-world problem, such as designing a roadway, an intersection, or a public transit system. The course emphasizes hands-on experience with design, analysis, and project management.

Prerequisites: Senior Classification, Civil Engineering Majors only. Course must be scheduled in the final year of graduation and with Instructor's consent.

Learning Outcomes of Instruction

By the end of this course, students will be able to:

1. Apply transportation engineering principles to the design of infrastructure projects.
2. Conduct detailed traffic analysis and design.
3. Develop and implement project management plans.
4. Perform environmental impact assessments.
5. Work effectively in teams to complete a project.
6. Communicate project results through written reports and oral presentations.

COURSE REQUIREMENTS

Minimal Technical Skills Needed:

- Microsoft Office - MS Word, Excel, PowerPoint
- Transportation analysis software (e.g., Synchro, VISSIM)
- CAD software (e.g., AutoCAD, Civil 3D)

Instructional Methods:

The instructional methods in this course include: lectures, hands-on projects, team activities, progress reports, and presentations. Course materials will be posted on the course website.

Student Responsibilities or Tips for Success in the Course:

Students must attend course meetings, participate in class work and discussions, and perform required course assessments supporting the anticipated learning objectives, such as progress reports and design demonstrations. Students are expected to regularly log into the course website to download course material, submit their coursework as instructed, and follow up on new announcements. This course covers advanced content that requires at least 6 hours of extensive work per week.

Attendance Policy

Class Attendance Requirement (one lateness = 1/2 absence):

# of Absences	Point Deduction
0 - 3	0
4 - 5	-2
6 - 7	-4
>7	-30

GRADING

Final grades in this course will be based on the following scale:

Grade	Percentage
A	90%-100%
B	80%-89%

Grade	Percentage
C	70%-79%
D	60%-69%
F	59% or Below

Assessments

The following assessments will be performed during this course to assess individual progress towards learning outcomes:

Assessment	Weight	Due Time
Team Formation and Project Proposal	10%	September 15, 2023
Preliminary Design Review	15%	October 10, 2023
Traffic Analysis and Design	20%	November 7, 2023
Midterm Presentation	10%	December 5, 2023
Environmental Impact Assessment	15%	February 15, 2024
Detailed Design Document	20%	March 20, 2024
Final Presentation and Demonstration	10%	April 10, 2024

Relationship between Assessments and Course/Student Learning Outcomes

Learning Outcomes of Instruction	Assessment
1. Apply transportation engineering principles to the design of infrastructure projects.	Project Proposal, Design Reviews, Reports
2. Conduct detailed traffic analysis and design.	Traffic Analysis, Design Documents
3. Develop and implement project management plans.	Project Proposal, Progress Reports
4. Perform environmental impact assessments.	Environmental Impact Assessment
5. Work effectively in teams to complete a project.	Team Activities, Presentations
6. Communicate project results through written reports and oral presentations.	Reports, Presentations

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Capstone Project

Students are required to work on a design project, present their work progress on a regular basis, perform design demonstrations of their design, and submit a comprehensive final report of their design by the end of the course. Students will work in groups. The project design process includes problem statements, objectives, technical design specifications, component selections, design constraints, professional codes and standards, and project management and implementation. This project should demonstrate the student's ability to transfer the knowledge and skills acquired in their civil engineering courses to provide solutions for real-world applications.

Student Outcomes (ABET)

The civil engineering program must have documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering. Student outcomes are outcomes (1) through (7), plus any additional outcomes that may be articulated by the civil engineering program. This course will assess the achievement of the following student outcomes:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

TECHNOLOGY REQUIREMENTS

LMS:

All course sections offered by Central Technical University have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements:

- LMS Requirements: LMS Requirements
- YouSeeU Virtual Classroom Requirements: YouSeeU Requirements

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ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@ctu.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all coursework in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a CTU campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support:

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: Brightspace Support

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COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies:

Syllabus Change Policy:

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures:

Student Conduct:

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook. Student Guidebook

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette

Attendance:

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01. Attendance Policy

Academic Integrity:

Students at Central Technical University are expected to maintain high standards of integrity and honesty