

Instructor: Promotes Saha, Ph.D., P.E.

Office: Room 321C

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Office Hours: MW 3:30 – 4:30 PM, or by Appointment.

Course Website: All course materials and grades will be posted on the Blackboard site.

Reference books:

- Garber and Hoel, Traffic and Highway Engineering, Brooks/Cole, Current Edition.
- Institute of Transportation Engineers (ITE). Transportation Planning Handbook, 4th edition. John Willey & Sons, Inc., 2016
- Highway Safety Manual, 1st Edition, 2010, American Association of State Highway and Transportation Officials.

Course Description:

This class is an introduction to transportation planning in urban areas. The course will cover the history of urban transportation planning, transportation data sources and surveys, fundamentals of travel demand and network modeling, financial issues, pavement and safety management systems, transportation planning and environmental issues, local and federal regulations and policies, and contemporary issues.

Prerequisite: CE 34500

Course Objectives:

Student will understand and apply basic concepts and methods of urban transportation planning in the US. Student will learn methods of designing, conducting and administering surveys to provide the data required for transportation planning. In addition, students will understand and be able to apply travel demand molding, pavement and safety management systems, project development and financing, regulations and policies, environmental related issues, land use and contemporary issues in transportation planning.

Grade Distribution:

Participation: 10%
Quizzes: 5%
Exams (2x20%): 40%
Course Project: 20%
Homework: 25%

Grading Range:

<i>Grade</i>	<i>Percentage</i>	<i>Grade</i>	<i>Percentage</i>
A	93 ≤ Score ≤ 100	C	73 ≤ Score < 77
A-	90 ≤ Score < 93	C-	70 ≤ Score < 73
B+	87 ≤ Score < 90	D+	67 ≤ Score < 70
B	83 ≤ Score < 87	D	63 ≤ Score < 67
B-	80 ≤ Score < 83	D-	60 ≤ Score < 63
C+	77 ≤ Score < 80	F	Score < 60

Tentative Schedule of Course Topics:

<i>Week</i>	<i>Topic</i>
Week 1	Design, conduct and administer surveys to provide the data required for transportation planning.
Week 2	Learn and understand zonal demand generation and attraction regression models. [1, 2, 6, 7]
Week 3	Learn and understand demand distribution models (gravity models). [1, 2, 6, 7]
Week 4	Learn and understand modal split models for mode choice analysis. [1, 2, 6, 7]
Week 5 & 6	Traffic assignment: Minimum path algorithm, network loading, user equilibrium and system optimum, and capacity restraint.
Week 7	Develop and calibrate trip generation rates for specific types of land use developments. [2, 6, 7] Estimate the traffic impact of new developments using the four-stage sequential models. [2, 6, 7]
Week 7	Review and Exam 1
Week 8, 9 & 10	Summarize pavement condition of a transportation network. Develop a pavement management system using optimization techniques. [1]
Week 11 & 12	Identify high risk locations for safety improvements. [1] Develop a safety management system using optimization techniques. [1]
Week 13	Thanksgiving
Week 14	<ul style="list-style-type: none"> • Make final decisions among planning alternatives that best integrate multiple objectives such as technical feasibility and cost minimization. [1, 2, 6] • Understand selected emerging contemporary transportation issues including congestion management and environmental mitigation. [1] • Learn the federal legislation and planning regulations pertaining to transportation planning issues [1] • Understand and apply the process of financing to transportation projects [1, 2, 7]
Week 15	Lecture 1: Course project presentation Lecture 2: <ul style="list-style-type: none"> • Understand transportation project planning and development. [1] • Impact of the transportation project on the land use. [1, 2, 6, 7]
Final Exam Week	Final Exam
Dec 23	Final grades due

Professional Responsibilities:

Attendance – Purdue University at Fort Wayne has a policy on absences:

<http://bulletin.ipfw.edu/content.php?catoid=25&navoid=639> . Students are expected to attend all classes. Attendance will be taken in the class. In case, a student misses a class, he/she is responsible to cover the class. Excessive absences may lower your grade.

Late Assignments – Late assignments will not be accepted. All assignments are due at the beginning of the class period on the date due unless otherwise stated.

Missed exams will receive a grade of zero except in the case of a documented emergency.

Harassment, Discrimination, and Sexual Misconduct – Students should read the [Student Handbook](#) carefully and know they are responsible for the content. The Purdue University Fort Wayne is built upon

a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated. All students are expected to maintain professional behavior in the classroom setting (discussion threads, e-mails, and chat rooms are all considered to be equivalent to classrooms).

Academic Honesty – Academic honesty is expected of all Purdue University students. Academic dishonesty includes, but is not limited to cheating, plagiarism, and theft. Any student found guilty of academic dishonesty is subject to disciplinary action, which may include, but is not limited to, (1) a failing grade for the test or assignment in question, (2) a failing grade for the course, or (3) a recommendation for dismissal from the University. (See University's webpage:

<https://www.pfw.edu/committees/senate/regulations/honesty.html>

Accommodations – If you have a disability and need assistance, special arrangements can be made to accommodate most needs. Contact the Director of Services for Students with Disabilities (Walb Union, Room 113, telephone number 481-6658) as soon as possible to work out the details. The SSD office will provide you with a Disability Accommodation Verification Card attesting to your needs for modification that you need to bring to me. For more information, please visit the web site for

<https://www.pfw.edu/disabilities/> .

ABET Program Outcomes:

A student who successfully completes the program will have demonstrated:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. 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
3. An ability to communicate effectively with a range of audiences
4. 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
5. 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
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Course Outcomes:

Students who successfully complete this course will be able to (Specific ABET outcomes are provided at the end of each course outcomes):

1. Design, conduct and administer surveys to provide the data required for transportation planning.
2. Learn and understand zonal demand generation and attraction regression models.
3. Learn and understand demand distribution models (gravity models).
4. Learn and understand modal split models for mode choice analysis.
5. Develop and calibrate trip generation rates for specific types of land use developments.
6. Estimate the traffic impact of new developments using the four-stage sequential models.
7. Summarize pavement condition of a transportation network.
8. Develop a pavement management system using optimization techniques.

9. Identify high risk locations for safety improvements.
10. Develop a safety management system using optimization techniques.
11. Understand transportation project planning and development.
12. Understand and apply the process of financing to transportation projects.
13. Learn the federal legislation and planning regulations pertaining to transportation planning issues.
14. Impact of the transportation project on the land use.
15. Understand selected emerging contemporary transportation issues including congestion management and environmental mitigation.
16. Make final decisions among planning alternatives that best integrate multiple objectives such as technical feasibility and cost minimization.
17. Communicate effectively via class technical discussions and presentations.
18. Design transportation related project in a team of two or three students and submits a final report and conduct a presentation.