

CE 561

Transportation Systems Evaluation



Course Information

Samuel Labi

Transportation and Infrastructure Systems Engineering
Purdue University
W. Lafayette, IN 47907

CE 561: TRANSPORTATION SYSTEMS EVALUATION

Instructor:

Teaching Assistants:

Office hours of the instructor and TA's will be announced in due course.

Course Type

CE561 is a core course for MS in Transportation and Infrastructure Systems Engineering. However, it is useful to all graduate and undergraduate students who intend to pursue a career in areas related to transportation and infrastructure planning and management.

Course Objective

The goal of the course is to introduce the students to the techniques and methods of evaluation of transportation plans and projects. The course focuses on application of engineering economic analysis and evaluation of environmental consequences of transportation projects. In addition, such topics as transportation programming, financing and management are also discussed.

Course Description

This course starts with a definition of the transportation development process, and identifies strategic considerations that are necessary for any evaluation of a transportation project. Then this course discusses performance measures, costing, and demand estimation for transportation. Transportation user consequences such as travel time, safety, and vehicle operating costs are presented with a highway flavor. Then the analysis of economic efficiency on the basis of these performance measures is presented. The course then delves into the so-called non-user or community impacts of transportation systems construction and operations, including land-use, air quality, noise, water and ecology, economic development, and energy. Methods for evaluation and decision-making that encompasses multiple performance measures are then presented. The importance of geographical information systems is stressed, and finally, techniques for the programming of transportation projects are presented. A number of short-length video clips will be shown in class to illustrate the impacts of transportation improvements.

Course Pre-requisites

CE 361, or the consent of the Instructor.

Grading Scheme

Quizzes (4)	10%
Term Paper	40%
Mid-Term Exam	20%
Final Exam	30%

Also, students are expected to submit all homework assignments in a timely fashion, or may otherwise suffer a level loss in their overall grade.

Course Material

Course text: Transportation Decision Making - Principles of Project Evaluation and Programming, by Sinha and Labi, Published by Wiley and Sons in 2007.

Other course references and material will be available at the course blackboard site.

GENERAL COURSE OUTLINE

Chapter 1: Intro. Concepts in Transp. Decision Making

Chapter 2: Performance Measures

Chapter 3: Transportation Demand and Supply

Chapter 4: Transportation Costs

Chapter 5: Travel Time Impacts

Chapter 6: Safety Impacts

Chapter 7: Impacts on Vehicle Operating Costs

Chapter 8: Economic Efficiency Impacts

Chapter 9: Economic Development Impacts

Chapter 10: Air Quality Impacts

Chapter 11: Noise Impacts

Chapter 12: Impacts on Wetlands and Other Ecosystems

Chapter 13: Impacts on Water Resources

Chapter 14: Energy Impacts

Chapter 15: Land Use Impacts

Chapter 16: Visual Impacts

Chapter 17: Socio-Cultural Impacts

Chapter 18: Multiple Criteria Evaluation

Chapter 19: Information Management (GIS)

Chapter 20: Transportation Programming