1. *Course number and name*

**ENGR 438: Transportation Planning**

1. *Credits, contact hours, and categorization of credits in Table 5-1 (math and basic science, engineering topic, and/or other)*

3 credit hours: two 50-min lectures plus one 2.75-hour lab session per week

1. *Instructor’s or course coordinator’s name*

Instructor: Yiyi Wang

1. *Text book, title, author, and year*

No textbook. Class notes and excerpts of book chapters and technical reports are provided.

1. *Specific course information*
2. *brief description of the content of the course (catalog description)*

Transportation planning concerns a broad range of problems fundamental to the safe, efficient and sustainable operations of multimodal transportation systems that consists of pedestrians, public transit, personal automobiles, among other modes. Students will learn the classic four-step travel demand model to estimate traffic impacts and infer road bottlenecks as well as the design of pedestrians and bicycle facilities, and how a multi-modal system interacts with land use, social equity, and environmental justice. Students will also gain experience with ArcGIS and Python software and basic coding skills that are in high demand with employers.

1. *prerequisites or co-requisites*

ENGR 271 or equivalents and (2) MATH 245 (which can be taken concurrently with this course).

1. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

Elective for Civil Engineering

1. *Specific goals for the course*
2. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.* 
   * Student will appreciate the societal and environmental impacts of travels and transportation projects.
   * Student will be able to explain the importance of travel demand models and how they can be used to achieve sustainable development of cities and towns.
   * Student will be able to enumerate the assumptions underlying the four-step travel demand models.
   * Student will be able to implement a four-step travel demand model by hand.
   * Student will be able to compare and contrast various ways to provide for alternative modes (bicycles and pedestrians).
   * Student will apply ArcGIS software to visualize and analyze urban travel data.
3. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): 1, 2, 4, 5, 6, 7

1. *Brief list of topics to be covered*

* Travel characteristics and data
* Four-step travel demand models
* Bike network design
* Bicycle facility design
* Data analysis