ABET course syllabus (Highway & Traffic Engineering)

1. *Course number and name*
   0901481: Highway & Traffic Engineering

2. *Credits and contact hours*
   3 Credit Hours

3. *Instructor's or course coordinator's name*
   Instructor: Hana Naghawi, Associate Professor of Civil Engineering
   Course Coordinator: Hana Naghawi, Associate Professor of Civil Engineering

4. *Text book, title, author, and year*
   - "Traffic and Highway Engineering"; N.J.Garber and L.A. Hoel; 4TH Ed.

   a. *other supplemental materials*
   - "A Policy on Geometric Design of Highway and Streets (AASHTO)" 5TH Ed.
   - "Highway Capacity Manual", 4TH Edition, transportation Research Board, Washington DC, 2000.

5. Specific course information
   a. *brief description of the content of the course (catalog description)*
      Highway systems, highway evaluation, driver, pedestrian and vehicle characteristics, traffic characteristics, geometric alignment, roadside design, intersections and interchanges design, drainage and drainage structures, contracts and supervision, traffic accidents and safety, parking, pedestrian, speed, travel time and traffic volume studies, traffic signals and control devices.

   b. *prerequisites or co-requisites*
      Prerequisite: Surveying Lab (0901282)

   c. *indicate whether a required, elective, or selected elective course in the program*
      Required for Civil Engineering

6. Specific goals for the course
   a. By the end of this course, the student will be able to:
   - Develop a basic understanding of the principles of highway engineering and traffic analysis.
   - Apply these concepts and principles to analyze various traffic characteristics and problems.
   - Achieve a thorough knowledge and understanding of highway engineering principles and practice, as it refers to geometric design. The principles and practice of route location and geometric design of highways
   - Understand fundamentals of traffic signal control technique and to be able to set traffic signals

   b. *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): c, e, h, j and k

7. *Brief list of topics to be covered*
   - **Traffic Engineering**

- Introduction to Traffic Engineering
- Traffic Stream Elements
- Traffic Operations
- Traffic Flow Characteristics
- Macroscopic Traffic Characteristics
- Microscopic Traffic Characteristics
- Traffic Flow Models
- Capacity and Level of Service Analysis
- Traffic Engineering Studies

- **Highway Engineering**
  - Highway Surveys and Location
  - Geometric Design of Highway Facility
  - Highway Drainage

- **Junction Design**
  - Principles of junction design
  - Signal control at isolated intersections
  - Design of at-grade intersections
  - Unconventional Intersection Design