# Syllabus

1. What is the pre-requisite for this course?
2. Where can you find the instructors office hours?
3. Is attendance required?
4. What percentage of your overall grade comes from exams?
5. Are late assignments accepted?
6. What is the name of textbook of this course?
7. Write three topics that will be covered in this course?

# Transportation planning, in general

1. Define sustainable transportation systems?
2. What is the main goal of transportation planning?

# Trip generation

1. What are the different types of socioeconomic data required in transportation planning? (2 points)
2. What is TAZ? Explain. (2 points)
3. What are the four steps in travel demand modeling? (2 points)
4. What is $R^{2}$ in regression analysis? (2 points)
5. When you are developing a model using regression analysis, how do you select the independent variables that are related to the dependent variable? (3 points)
6. List two variables that have an impact on trip productions? (3 points)
7. List two variables that have an impact on trip attractions? (3 points)
8. What are the techniques to estimate trip productions? (2 points)
9. What are the different types of sampling for statistical analysis? (2 points)
10. What is stratified sampling? (2 points)

# Trip Distribution

1. What is trip distribution? (2 points)
2. How do you estimate trip distribution? (2 points)
3. What are the full forms of HBW, HBO, and NHB?
4. Explain gravity model? (7 points)
5. Explain friction factor? (3 points)
6. Explain uniform growth factor model? (3 points)

# Mode choice

1. What does utility function measure? (2 points)
2. What do you mean by probability of selecting auto mode equals to 0.85. (2 points)
3. What is the equation to calculate probability of selecting a mode? (2 points)
4. Explain utility function? (4 points)
5. Explain$ P\_{auto}\_{ 14}=0.75$? (3 points)
6. List three mode selection attributes? (3 points)

# Traffic Assignment:

1. Define traffic assignment (2 points)
2. Define user equilibrium and social optimum. (4 points)
3. What are the Wardrop’s principle for traffic assignment? (4 points)
4. Explain minimum path tree? (3 points)
5. Explain network loading? (3 points)

# Traffic Impact Study

1. What is traffic impact study? (2 points)
2. Define horizon years for traffic impact study? (2 points)
3. Draw a map to show local, collector and arterial roads?
4. Calculate Million Vehicle Miles Travel of a roadway corridor in 2017 which is 25 miles long and has ADT 5,000.
5. Briefly define the 3C process.
6. What is FAST act?
7. What are the basic elements of planning?
8. What is benefit-to-cost (B/C) ratio? Explain B/C ratio = 1.5:1
9. What are the major components of travel behavior?
10. Draw a figure showing land accessibility and mobility by different road functional classification.
11. Draw a figure showing delay for different hours of the day.
12. Briefly explain travel characteristics?
13. What are the measures of transportation system performance?

# Safety Management Systems

1. What is objective of Safety Management System? What are the constraints? (4 points)
2. Define hazardous locations in traffic safety area. (2 points)
3. Draw a flowchart showing Roadway Safety Management Process.
4. What is network screening?
5. List five performance measures to evaluate safety.
6. What are the techniques to identify hazardous locations?
7. What is the Regression-to-the-Mean bias?
8. What are the three steps in diagnosis of safety analysis? (2 points)
9. What is collision diagram? (2 points)
10. What types of data we collect for each crash? (2 points)
11. What are the uses of ArcGIS? (2 points)
12. What are the uses of Excel Solver? (2 points)
13. List at least five factors for crashes in general (2 points)
14. Draw a flowchart for economic appraisal process (4 points)

# Pavement management systems

1. What are the pavement condition parameters? (2 points)
2. What is maintenance decision tree? (2 points)
3. What is pavement deterioration model? (2 points)
4. What are the pavement deterioration modeling techniques? (2 points)
5. Draw a figure showing rut depth? (2 points)
6. What are the differences between pavement deterioration and performance models? (3 points)
7. What are the steps in Markovian Probabilistic process? (2 points)
8. Write the equation to calculate effectiveness ratio of a pavement maintenance strategy. (3 points)
9. Explain effectiveness of a pavement maintenance strategy. (3 points)