Department of Civil Engineering

Course Name:

Advanced Bituminous Materials

Course Number: 20-438	**Credit:** 3
Program: Graduate	**Course Type:** Technical Required
Prerequisite: -	**Corequisite:** -

Course Description (Objectives):
The main goal of this course is to understand the rheological and chemical behavior of asphalt and its impact on the performance of asphalt mixtures. Students will also become familiar with asphalt pavement technologies, including preparation, execution, and testing, as well as topics such as mix design, recycling, additives, and modifiers.

Course Content (outline):

- Chapter 1: Overview of the PG method
- Chapter 2: Overview of the history of different types of asphalt
- Chapter 3: Overview of asphalt refining methods in refineries
- Chapter 4: The concept of rheology
- Chapter 5: Rheology of asphalt
- Chapter 6: Pavement performance and its failures influenced by the rheological behavior of asphalt
- Chapter 7: Modeling the rheological behavior of asphalt and its application in asphalt modification
- Chapter 8: Chemistry of asphalt
- Chapter 9: Aggregates in asphalt mixtures: preparation, sampling, and petrology
- Chapter 10: Overview of the history of asphalt mix design
- Chapter 11: Overview of the Marshall mix design method
- Chapter 12: Superpave mix design method
- Chapter 13: Key properties of asphalt mixtures
- Chapter 14: Topics related to the construction and compaction of asphalt mixtures
- Chapter 15: Asphalt mix recycling and its various methods
- Chapter 16: Introduction to special asphalt mixtures
- Chapter 17: Additives and modifiers
- Chapter 18: Overview of asphalt and mixture testing methods

References:

- Hot Mix Asphalt Materials, Mixture Design, and Construction, By: NCAT, 1996