Academic Year: 2023-2024	Semester: Fall	Starting Date: 15-10-2023

Course Name	**Asphalt Pavement Technology**
Module Language	English
Instructor	**Asst. Prof. Dr. Abdulhakim O. Salih Kozapanky**
Teaching Assistance(s)	None
College/University	College of Engineering – Salahaddin University-Erbil
Department	Civil
Semester Duration	15 weeks
Course Overview	During the past century, highway transportation has evolved from the "out of the mud" era to one in which a network of highways provides multiple levels of service from uncontrolled to controlled access. Improvements in asphalt technology have played a key role in expanding the highway network, as well as in expediting pavement maintenance and rehabilitation operations with minimal delays to the traveling public. Nearly all of our surfaced roads has bituminous surfacings or surface courses. With the growing requirements of new construction and maintenance of existing roads, our annual consumption of bitumen has increased. Bitumen is used in road work in a variety of ways, ranging from thin surfacings to high quality surface courses. This work is carried out under wide ranging climatic conditions and methods of construction.
Course Objectives	The objective of this course is to provide students with an understanding of the important problems associated with Asphaltic materials: Types [Asphalts, Cutbacks, Emulsions and Tars], Productions, Chemical compositions, properties and grads. Also explaining Rheological Characteristics of asphalt and different Models explaining its behavior. Preparing of aggregates and blending for Bituminous mixture. How to design of Bituminous mixes through their Properties and considering Factors affecting. Mechanical Tests for bituminous Mix Design. Different Additives added to Asphalts. Types of Pre-mix Methods-Plant Mixes: Construction and Quality control, failures in asphalt surfacings and Specifications of special bituminous mixes.

Course Contents

Week	Lecture
1st	**Introduction**
2nd	**Pavements and Types of roads**
3rd	**Asphalts: Types, Production, Chemical composition, properties and grade**
4th	**Rheological Characteristics of asphalt and different Models explaining its behavior**
5th	**Cut Back Asphalts , Asphalt Emulsions and Road Tars**
6th	**Lab.Tests on Asphalt Cement, Cut , Emulsions and Road Tars**
7th	**Aggregate Properties and Grading**
8th	**Sampling of Aggregates for Bituminous Mixes and Blending**
9th	**Bituminous mixes: Properties .Factors involving and Design procedure**
10th	**Mechanical Tests for Bituminous Mix Design**
11th	**Use of Rubber and Other Additives in Asphalts**
12th	**Types of Asphalt Pavements; Construction and Quality control of: Surface Dressings, Prime Coat, Tack Coat, Seal Coat and Penetration Macadam.**
13th	**Types of Pre-mix Methods-Plant Mixes: Construction and Quality control of: Bitumen Bound Macadam, Bits. Pre-Mix Carpet, Bits Concrete, Sheet Asphalt and Mastic Asphalt**
14th	**Maintenance of asphalt surfacing & Specifications of special bituminous mixes**
15th	**Final Examination**

Textbooks and References	1. AASHTO Material: Part 1: Specifications, Part 2: Tests. 2. SORB: Standard Specifications of Roads & Bridges, Iraq. 3. Highway Engineering Hand Book, by: Woods 4. Asphalt Pavement Engineering, Theory& Practice, by: Wallace& Martin. 5. Soil Mechanics for Road Engineers, TRRL. 6. Principles of Pavement Design, Yoder. 7. Highway Materials, by: Krebs 8. Bituminous Road Construction, Hand Book, by: K.P.Nair.et.al.
Teaching Style	2 hrs. Theory in Class&1hr. Practical in Lab.
Requirements for Credit Points	For the award of credit points, it is necessary to pass the module exam. It contains: An examination during the academic semester, Quizzes, Assignments, and Final examination. **Student's attendance is required in all classes**.
Credit ECTS	6
Grade Distribution	The following grade system is used for the evaluation of the module exam: The module exam is based on the summation of two categories of evaluations: **First: (50%)** of the mark is based on the academic semester effort which includes: - Midterm Exam = 20%. - Quizzes = 5% - Seminar = 10% - Review Article = 15% **Second: (50%)** of the mark is based on the final examination that is comprehensive for the whole of the study materials reviewed during the academic semester.
Workload	Workload 10hrs/w (150hrs/s): Contact face-to-face 3hrs/w (45hrs/s) and Non-Contact Self learning 7hrs/w (105hrs/s)