Course description

1. Course Name:
Highway Engineering / stage Four
2. Course code:
WCV-42-03
3. Chapter/Year:
Semester 2/2025-2026
4. Date this description was prepared:
2026/2/1
5. Available forms of attendance:
In-person education
6. Number of study hours (total) / Number of units (total):
30hours of theory + 30 hours of practical work
7. .Name of the course coordinator:
Dr. Azher Ibrahim Kreem , Email: Azher.ibrahim@uowa.edu.iq
8. .Course Objectives

A. Understanding the evolution of road construction B. Studying road location and alignment C. Introducing students to the technical details of highway engineering and its types D. Identifying the materials used in road construction E. Describing the structure and function of road infrastructure F. Studying asphalt and concrete road layers F. Studying the design of flexible and concrete roads D. Familiarizing students with road defects and how to address them Course Outcomes, Teaching and Learning Methods, and Assessment	**Goals**

9. Teaching and learning strategy	
The main strategy adopted in delivering the course is to encourage student participation in exercises while developing their critical thinking skills. This will be achieved through lectures, interactive lessons, and simple experiments involving sampling activities of interest to students, in addition to the following: 1- Delivering theoretical lectures. 2- Showing short scientific films. 3-Conducting experiments in the methods lab. 4-Using brainstorming to convey the material.	strategy

Course description

10. Course structure

Evaluation Method	Teaching method	the topic	Required learning outcomes	Hours	Week
1- Participation in class . 2- .Short written quizzes . 3 -Discussion and Dialogue with students . 4-Submission of homework Assignments required at the end of each topic . 5- .Attendance . 6- .Monthly written quizzes. 7- .Final midterm exam . 8- Presenting posters on various issues .	A comprehensive introduction to each topic of study, linking the current topic to previous ones. Delivering theoretical lectures. Showing short scientific films. Providing and explaining sufficient examples. Conducting experiments in the methods lab. Using brainstorming to convey the material.	Bituminous Mixes Types of Asphalt Mixes Aggregate Combination and Separation to Meet Job mix Load Carrying Mechanism Bituminous Mixture Technologies Requirements for a Bituminous Mixes Design of Bituminous Mixes Rigid Pavement reinforcement and joints Reinforcing Steel Joints in concrete pavements Types of rigid highway pavements Design of highway pavement Design Approaches Pavement Types and Materials Thickness Design of Flexible Pavements AASHTO Thickness Design for Rigid Highway Pavements	A- Cognitive Objectives -1Demonstrate an understanding of the need to develop highway engineering. -2Identify the behavior of soil beneath road structures. -3Identify the basic behavior of materials used in roads. -4Identify the main methods for designing asphalt mixes. -5Identify the main methods for designing road layers. Explain the details of road failure and apply road maintenance. B- Course-Specific Skills Objectives: -1Understand the layers of asphalt and concrete road structures. Design asphalt and concrete mixes for roads.	6 24 24 30 30 30 30	2-1 6-2 10-6 15-10 20-15 25-20 30-25

11. Course Evaluation

Midterm Exam = 15%
Quizs = 15%
Daily Attendance = 5%
Homework + Classwork = 5%
Practical Reports = 10%
Final Exam = 50%

Course description

12. Learning and teaching resources

Traffic and Highway Engineering, by Nicholas Garber & Lester A. Houel (4th Edition 2010)	Required textbooks (methodology, if applicable)
Principles of Pavement Engineering, by Nicholas Thom (2nd Edition 2014). Highway engineering, by P. H. Write & K.K. Dixon, 7th edition Highway engineering, by Olgesby & Hicks Highways, The Location, Design, Construction and Maintenance of Road Pavements. By Coleman O'Flaherty (4th Edition 2009) . General specification for road and bridge, by Ministry of housing and construction (revised edition, 2003) AASHTO Guide for Design of Pavement Structures, by AASHTO (1993), American Association of State Highway and Transportation Officials, Washington, D.C. Principles of Pavement Engineering, by Nicholas Thom (2nd Edition 2014). Highway engineering, by P. H. Write & K.K. Dixon, 7th edition Highway engineering, by Olgesby & Hicks Highways, The Location, Design, Construction and Maintenance of Road Pavements. By Coleman O'Flaherty (4th Edition 2009) . General specification for road and bridge, by Ministry of housing and construction (revised edition, 2003) AASHTO Guide for Design of Pavement Structures, by AASHTO (1993), American Association of State Highway and .Transportation Officials, Washington, D.C	Main references (sources)
Construction and Building Materials Journal /https://pavementinteractive.org	Recommended supporting books and references (curricular journals, reports…)
/https://www.highwaysmagazine.co.uk	Electronic references, websites