Course Description Form

1. Course Name:
Highway Engineering/ 4th
2. Course Code:
II M, II E
3. Semester / Year:
2023-2024 (Semester System)
4. Description Preparation Date:
15/03/2024
5. Available Attendance Forms:
By person
6. Number of Credit Hours (Total) / Number of Units (Total):
30 hrs. (theoretical) + 30 hrs. (practical)
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof Dr. Anmar Falih Diekan Ghazi Jalal Kashesh Email: a.f.dulaimi@uowa.edu.iq ghazi.alsaidy@uowa.edu.iq
8. Course Objectives

Course Objectives	a) Familiarity with the development of road construction. b) Study of site and alignment of roads. c) Introducing students to the technical details of highway engineering and its types. d) Understanding the materials used in road construction. e) Describing the structure and function of the road. f) Study of asphalt and concrete road layers. g) Study of flexible and concrete road design. h) Familiarizing students with road defects and their treatment. i) Course outcomes and teaching, learning, and assessment methods.

9. Teaching and Learning Strategies

Strategy	1. Providing a comprehensive introduction to each study to and connecting the current topic to previous ones. 2. Delivering theoretical lectures.

	3. Presenting short scientific films. 4. Providing and explaining sufficient examples. 5. Conducting experiments in the road laboratory. 6. Using brainstorming to convey the material.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2 2-6 6-10 10-15 15-20 20-25 25-30	6 24 24 30 30 30 30	**Cognitive goals: the student has to be able to:** 1. Demonstrating the understanding of the need for the development of highway engineering. 2. Identifying the soil behavior beneath road structures. 3. Determining the fundamental behavior of materials used in roads. 4. Identifying the main methods for designing asphalt mixtures. 5. Identifying the main methods for designing road layers. 6. Clarifying the details of r failure and appl road maintenance **Acquired skills from the course** 1. Understanding the layers of the asphalt and concrete road structure. 2. Designing asphalt concrete mixtures for road	Road Construction Development Pavement Structures Highway Location - Highway Alignment Requirements of the Highway Alignment Factors controlling alignment Survey and Plans Available Techniques of survey EARTHWORKS AND MASS-HAUL DIAGRAM Determining the Earthwork Volumes The Mass-Haul Diagram Pavement Materials Flexible Pavement Layers Rigid Pavement Layers Bituminous Material (Bitumen 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 Mixe Rigid Pavement reinforcement and joints Reinforcing Steel Joints in concrete pavements Types of rigid high pavements Design of highway pavement Design Approaches Pavement Types and Materials Thickness Design of Flexible Pavements AASHTO Thickness Desig Rigid Highway Pavements	1. Providing a comprehensive introduction to each study topic and connecting the current topic to previous ones. 2. Delivering theoretical lectures. 3. Presenting short scientific films. 4. Providing and explaining sufficient examples. 5. Conducting experiments in the road laboratory. 6. Using brainstorm to convey the mater	1. Participation within the classroom. 2. Short written tests. 3. Discussion and dialogue with students. 4. Assigning homework at the end of each topic. 5. Presenting posters about some road problems and their solutions. 6. Attendance. 7. Monthly written exams. 8. Final seme exam.

11. Course Evaluation

1. Participation within the classroom 2%.
2. Short written tests 3%.
3. Assigning homework at the end of each topic 5%.
4. Attendance 5%.
5. Monthly written exams 35%.
6. Final semester exam 50%.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Traffic and Highway Engineering, Nicholas Garber & Lester A. Houel (4 Edition 2010)
Main references (sources)	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 AASI (1993), American Association of State Highway and Transporta Officials, Washington, D.C.
Recommended books and references (scientific journals, reports…)	Construction and Building Materi Journal https://pavementinteractive.org
Electronic References, Websites	https://www.highwaysmagazine.co.uk/