



**Course Syllabus**  
**According to JORDAN National Qualification**  
**Framework (JNQF)**

**Course Name: Highway Engineering Lab**

**Course Number: 04034162**

### General Course Information:

Course title	Highway Engineering lab
Course number	04034162
Credit hours	Three Credit hours (Theory)
Education type	[Face-to-Face]
Prerequisites/corequisites	Pavement Design (403440)
Academic Program	Civil engineering
Program code	403
Faculty	Engineering
Department	Civil engineering
Level of course	4 <sup>th</sup> Year
Academic year /semester	1st Semester 2022-2023
Awarded qualification	B.Sc
Other department(s) involved in teaching the course	Non
Language of instruction	English
Date of production/revision	13-11-2022

### Course Coordinator:

Coordinator's name	Eng. Sora Omari
Office No	4249
Office Phone extension number	2662
Office Hours	Sun, Tue, Thu (9:00-10:00) and (11:00-12:00) Mon, Wed (9:30-11:00)
Email	Sora.omari@iu.edu.jo

### Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

### Course Description (English/Arabic):

English	California Bearing Ratio (CBR) tests. Tests of asphalt materials: say bolt viscosity test, ductility of bituminous materials, penetration of bituminous materials, flash and softening points, specific gravity of semi-solid bituminous materials, and method of hot mix design (Marshal test), extraction test, and skid resistance.
Arabic	تجربة نسبة قوة تحمل كاليفورنيا، تجارب الإسفلت: اللزوجة بأنواعها، الممتولية، الغرز، نقطة الوميض والاشتعال، نقطة اللبونة، التقشر والفقدان بالحرارة، الوزن النوعي، تصميم الخلطات الإسفلتية (تجربة مارشال)، الكثافة النظرية العظمى، تجربة فصل الإسفلت عن الركام، قياس خشونة سطح الطريق والتموجات، تجربة الاحتكاك بالبندول.

**Textbook: Author(s), Title, Publisher, Edition, Year, Book website.**

Nicholas J.Garber, Lester A. Hole, Traffic and Highway Engineering 4thEdt. & 5thEdt. - SI Edition 2010, 2014.

**References: Author(s), Title, Publisher, Edition, Year, Book website.**

1. Association of State Highway and Transportation Officials (AASHTO) Specifications and Guides, 2002
2. Asphalt Materials and Mix Design Manual.

**Course Educational Objectives (CEOs):**

1.	Pavement materials_ mainly bitumen_ properties and specifications through a series of tests and experiments.
2.	Basic principles of designing Hot Mix Asphalt (HMA) using Marshall Mix design procedure.

**Intended Learning Outcomes (ILO's):**

1.	Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:	Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	Descriptors**
2. A	<b>Knowledge and Understanding:</b>				
3. A1	Demonstrate an understanding of the basic concepts of Asphalt materials	1,2	1	1	K
4. A2	Ability to design and conduct experiments, as well as to analyze and interpret data	1,2	6	3	S
5. A3					
6. B	<b>Intellectual skills:</b>				
7. B1					
8. B2					
9. B3					
10. C	<b>Subject specific skills:</b>				
11. C1					
12. C2					
13. C3					
14. C4					
15. D	<b>Transferable skills:</b>				
16. D1	Ability to function on multidisciplinary teams	1,2	5	6	S
17. D2					
18. D3					

**\*Bloom Taxonomy Levels**

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

**\*\* Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.**

**Program Learning Outcome (PLOs):**

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (CE) program will demonstrate:		Descriptors**		
		K	S	C
1.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	✓		
2.	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.			✓
3.	An ability to communicate effectively with a range of audiences.		✓	
4.	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.			✓
5.	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.		✓	
6.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.		✓	
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	✓		✓

**\*\* Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

**Weekly Schedule**

✓ Face to Face

Week	First Hour + Second Hour + Third Hour	Ach. ILOs	Ach. PLOs	Descriptors*
1	Introduction (Report Writing Method, Types of Asphalt)	A1,A2,D1	1,6,5	K,S
2	Penetration Test	A1,A2,D1	1,6,5	K,S
3	Ductility Test	A1,A2,D1	1,6,5	K,S
4	Softening Point Test	A1,A2,D1	1,6,5	K,S
5	Flash and Fire Point Test	A1,A2,D1	1,6,5	K,S
6	Specific Gravity Test	A1,A2,D1	1,6,5	K,S

7	<b>Mid Term</b>			
8	<b>Kinematic Viscosity Test</b>	<b>A1,A2,D1</b>	<b>1,6,5</b>	<b>K,S</b>
9	<b>Extraction of Test</b>	<b>A1,A2,D1</b>	<b>1,6,5</b>	<b>K,S</b>
10	<b>California Bearing Ratio Test</b>	<b>A1,A2,D1</b>	<b>1,6,5</b>	<b>K,S</b>
11	<b>Marshal method of Mix Design</b>	<b>A1,A2,D1</b>	<b>1,6,5</b>	<b>K,S</b>
12	<b>Introduction to SUPERPAVE system</b>	<b>A1,A2,D1</b>	<b>1,6,5</b>	<b>K,S</b>
13	<b>Final Exam</b>			

\* K: Knowledge, S: Skills, C: Competency

### Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Interactive videos
- Practice Labs
- Discussion Forums
- Quizzes
- Other Interactive online activities
- Reports

### Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **20%**
- Midterm **30%**
- Final Exam **50%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

### Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**

- Access to the IU E-Learning Platform at:  
<https://elearn.iu.edu.jo/course/view.php?id=2105>
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

### Assessment Tools implemented in the course:

- ✓ Final Exam
- ✓ Midterm Exam
- ✓ Homework
- ✓ Practice Labs
- Discussion Forums
- ✓ Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching
- Others:.....

### Responsible Persons and their Signatures:

<b>Course Coordinator</b>	Eng. Sora Omari	<b>Completed Date</b>	
		<b>Signature</b>	
<b>Received by</b> (Department Head)	Dr. Ibrahim Varooqa	<b>Received Date</b>	
		<b>Signature</b>	