

## **COURSE Syllabus**

**Course Name: Pavement Design**

**Course Number: 04034161**

### General Course Information:

Course title	Pavement Design
Course number	04034161
Credit hours (theory, practical)	3 hours (theory)
Contact hours (theory, practical)	3 hours (theory)
Prerequisites/corequisites	Traffic Engineering (403345), Highway Design (403342)
Academic Program	Civil engineering
Program code	
Awarding institution	Isra University
Faculty	Engineering
Department	Civil engineering
Level of course	4rd year level
Academic year /semester	Summer Semester 2021/2022
Awarded qualification	B.Sc
Other department(s) involved in teaching the course	
Language of instruction	English
Date of production/revision	

### Course Coordinator: Dr.Eng. Hussein Saraireh

**Coordinator's Name:** Dr. Eng. Hussein Saraireh  
**Office No.:** 4308  
**Office Phone:** 2502  
**Office Hours:** 8 hours/ Sunday, Tuesday, Thursday: 10:00-12:30 and Monday, Wednesday: 10.00-11.00  
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### Other Instructors:

**Instructor's Name:**  
**Office No.:**  
**Office Phone:**  
**Office Hours:**  
**Email:**

## Course Description:

Introduction, Definitions, Function of Pavements, Typical Roadway Cross Section for flexible and rigid pavement, Soil engineering for highway, Soil characteristics, Basic properties of soil, AASTHO Soil Classification System, Soil surveys for highway construction, Soil Compaction, CBR Test, Hveem Stabil meter Test, Bituminous Materials, Refining of Petroleum, Types of Asphalt, Properties of Asphalt materials, Tests for Asphalt, materials, Asphalt concrete mixture, Marshall Stability Test, Mix Design, and Superpave Mix design system, Design of Flexible Pavements, soil stabilization, Typical Stress in Flexible Pavements, AASHTO Design Method, Design of Rigid Pavement, Material used in Rigid Pavement, Reinforcing Steel, Joints in Concrete Pavement, Stress in Rigid Pavement, and AASHTO Design Method, Pavement Maintenance & Rehabilitation, Pavement distress,

## Text Book: Author(s), Title, Publisher, Edition, Year, Book website.

1. 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.

Required book (s), assigned reading and audio-visuals:

1. AASHTO Guide for Design of Pavement structure, 2003.

## Course Educational Objectives (CEOs):

1.	Understand the Definitions, Function of Pavements, and Typical Roadway Cross Section for flexible and rigid pavement.
2.	Understand the Soil engineering for highway, Soil characteristics, Basic properties of soil, AASTHO Soil Classification System, Soil surveys for highway construction, Soil Compaction, CBR Test, Hveem Stabil meter Test.
3.	Know Bituminous Materials, Refining of Petroleum, Types of Asphalt, Properties of Asphalt materials, Tests for Asphalt, materials, Asphalt concrete mixture, Marshall Stability Test
4.	Design of Flexible Pavements, AASHTO Design Method, Design of Rigid Pavement, AASHTO Design Method, Pavement Maintenance & Rehabilitation, Pavement distress
5.	

## Intended Learning Outcomes (ILO's):

	Intended Learning Outcomes (ILO's)	Relationship to CEOs	Contribution to PLOs
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<b>A</b>	<b>Knowledge and Understanding:</b>		
A1	Understand the Definitions, Function of Pavements, and Typical Roadway Cross Section for flexible and rigid pavement.	1	A
A2	Understand the Soil engineering for highway, Soil characteristics, Basic properties of soil, AASTHO Soil Classification System, Soil surveys for highway construction, Soil Compaction, CBR Test, Hveem Stabil meter Test	3	J
A3	Know Bituminous Materials, Refining of Petroleum, Types of Asphalt, Properties of Asphalt materials, Tests for Asphalt, materials, Asphalt concrete mixture, Marshall Stability Test	7	C
A4	Design of Flexible Pavements, AASHTO Design Method, Design of Rigid Pavement, AASHTO Design Method, Pavement Maintenance & Rehabilitation, Pavement distress,	7	D
<b>B</b>	<b>Intellectual skills:</b>		
B1			
B2			
B3			
<b>C</b>	<b>Subject specific skills:</b>		
C1			
C2			
C3			
C4			
C5			
<b>D</b>	<b>Transferable skills:</b>		
D1			
D2			
D3			

### Topic Outline and Schedule:

Topic	Weeks	Achieved ILOs
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Introduction	1 <sup>st</sup> , 2 <sup>nd</sup> week	
Soil Engineering for Highway Design	2	
Bituminous materials	3	
Design of flexible pavement	4	
Design of Rigid Pavement	5	
Pavement management	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
<b>Final exam</b>	16	

### Teaching Methods and Assignments:

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

- Lectures
- Homework hand in
- Quizzes
- Written Exams

### Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

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

First Exam and second 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.

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

### Required equipment:

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### Assessment Tools implemented in the course:

- ☐ First Written Exam.
- ☐ Second Written Exam.
- ☐ Final Written Exam.
- ☐ Quizzes.
- ☐ Homework.
- ☐ Integrative Projects.
- ☐ Case Study.
- ☐ Written Reports.
- ☐ Participation in Lecture.
- ☐ Practice in the Lab.
- ☐ Illustrative Presentations.
- ☐ Oral Exams.
- ☐ Others (identify):

### 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 () program will demonstrate	
a.	Knowledge of the basics of mathematics, science and engineering with deep knowledge of civil engineering.
b.	Achieve and identify engineering problems, social knowledge, health, safety, legal, management, sustainability and cultural issues and the consequent responsibility towards civil engineering.
c.	Ability to apply knowledge in mathematics, science and engineering.
d.	Ability to design, conduct experiments, analyze and interpret data.
e.	The ability to design a system, component or process to meet the needs required within the constraints of real economic, environmental, social, political and moral in addition to the requirements of health, safety, construction and sustainability.
f.	Ability to identify, formulate and solve engineering problems.
g.	Extensive education necessary to explain the impact of engineering solutions in a comprehensive economic, environmental and social context.
h.	Ability to use the techniques, skills and modern engineering tools for engineering practices.
i.	Ability to work with multidisciplinary teams.

### Responsible Persons and their Signatures:

Course Coordinator	Dr.Eng. Hussein Saraireh	Completed Date	/ /
		Signature	
Received by (Department Head)	Dr. Ibrahim Varouqa	Received Date	/ /
		Signature	