



# Course Book

<p><b>Course Description</b></p>	<p>Since that time, asphalt technology has made giant strides so that today the equipment and techniques used to build asphalt pavement structures are highly sophisticated. Asphalt Concrete is a composite material commonly used in construction of roads, highways, airports, parking lots, and many other types of pavement.</p>				
<p><b>Course objectives</b></p>	<p>The purpose of this intensive course is to provide a basic understanding of all phases of asphalt technology. Upon completion, the participant will be able to make knowledgeable decisions related to asphalt pavements and communicate effectively with asphalt specialists when the need arises.</p>				
<p><b>Student's obligation</b></p>	<p>a. To attend the classes regularly with minimum absence.  b. To participate actively in the class discussion and Q&amp;A session  c. Study on daily basis to digest the class material  d. To write note off-handouts  e. Prepared for sudden Quizzes  f. Vet through the references provided by the lecturer and to solve as much as possible of homework and exercises for the subjective materials.</p>				
<p><b>Required Learning Materials</b></p>					
<p><b>Evaluation</b></p>	<p><b>Task</b></p>		<p><b>Weight (Marks)</b></p>	<p><b>Due Week</b></p>	<p><b>Relevant Learning Outcome</b></p>
	<p>Paper Review</p>				
	<p>Assignments</p>	<p>Review Article</p>	<p>10</p>		
		<p>Attendance</p>	<p>5</p>		
		<p>Report</p>			
		<p>Seminar</p>	<p>5</p>		
		<p>Essay</p>			
		<p>Project</p>			
	<p>Quiz</p>		<p>10</p>		
	<p>Lab.</p>				
	<p>Midterm Exam</p>		<p>20</p>		
	<p>Final Exam</p>		<p>50</p>		
	<p>Total</p>		<p>100</p>		

**Specific learning outcome:**

By the end of the current course, the student shall be able to learn the major activities related to the asphalt mixtures design which is the part the makes the backbone for any constructional project. This course is aimed at providing the Highway Engineering students with basic understanding of the Highway Engineering materials and the basic and fundamental design concept of highway pavements structures. Students will be able to design and analyse flexible pavements in addition, they will be able to understand the basic elements of pavement design. Students will be able to conduct a thorough analysis of stresses, strains and deflections developed by different axle configurations and loads in multi layer flexible pavement structures. Students will study the effect of both traffic and environment on pavement damage. The course provide sufficient coverage of highway materials using SUPERPAVE characterisation methods, hot mix asphalt design by using Marshall design methods. Students will learn how to design new structure by asphalt mix layers

**Course References:**

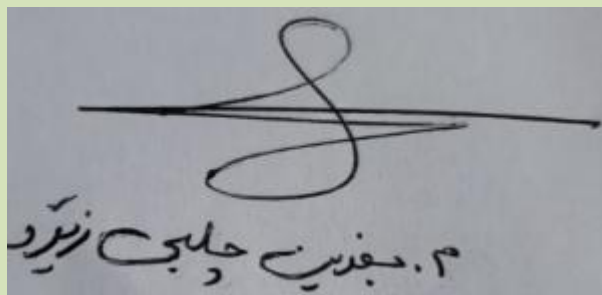
- 1-pavement design and materials by Papagiannakis ,and Masad -2008
- 2- Highway and traffic engineering ...by N.J. Garber and L.A. Hoel,,2009 4<sup>th</sup> edition.. University of Virginia,USA.
- 3- Highway engineering by Nikolaidis, 2015
- 4-SORB 2007
- 5-Asphalt Institute Manual MS-2 7<sup>th</sup> edition

<b>Course topics (Theory)</b>	<b>Week</b>	<b>Learning Outcome</b>
INTRODUCTION	<b>1</b>	
Asphalt manufacturing & Anti-sripping Agents	<b>2</b>	
Chemical composition	<b>3</b>	
Modification	<b>4-5</b>	
Aggregates	<b>6</b>	
Filler types	<b>7</b>	
Marshall mix design	<b>8</b>	
Superpave mix design	<b>9-10</b>	
Asphalt models	<b>11</b>	
Asphalt pavement layers	<b>12</b>	
P G Zone	<b>13</b>	
Performance grade of asphalt	<b>14</b>	
<b>Practical Topics</b>	<b>Week</b>	<b>Learning Outcome</b>


## Questions Example Design

## Extra notes:

## External Evaluator



Handwritten signature and name in Arabic script: ٣.٢ مبدئياً حليبي زبير