

Module (Course Syllabus) Catalogue 2022-2023

College/ Institute	Erbil Technical Engineering College	
Department	Highway Engineering Techniques	
Module Name	Construction Materials	
Module Code	COM205	
Degree	Technical Diploma <input type="checkbox"/>	Bachelor <input checked="" type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/> PhD <input type="checkbox"/>
Semester	2 nd	
Qualification		
Scientific Title	PhD holder	
ECTS (Credits)	5	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours	4	
Weekly hours (Theory)	(2) hr Class	(135)Total hrs Workload
Weekly hours (Practical)	(2) hr Class	(135)Total hrs Workload
Lecturer (Theory)	Dr. Hawreen Hasan Ahmed	
E-Mail	hawreen.ahmed@epu.edu.iq	
Lecturer (Practical)	Dr. Hawreen Hasan Ahmed	
E-Mail & Mobile NO.	hawreen.ahmed@epu.edu.iq	
Websites	https://scholar.google.com/citations?user=xSn7en4AAAAJ&hl=en&oi=ao https://academicstaff.epu.edu.iq/faculty/Hawreen.ahmed	

Course Book

Course Description	Increase student knowledge and learn the principles and practices for the characterization, production, and application of different Highway Construction Material types. This includes testing and studying processes for durable and high performance modern materials.				
Course objectives	<p>The main objectives to be achieved after the completion of this course are summarized below:</p> <ul style="list-style-type: none"> ○ Identify occupations related to the construction materials; ○ State the differences between past and present methods of construction; ○ Identify a variety of systems, methods, and materials used for highway construction ;technology ○ Learn and use safe work habits and techniques. 				
Student's obligation	<p>The students are required to fulfil the following requirements:</p> <ul style="list-style-type: none"> ✓ Attendance ✓ Participation in problem solving and class activities ✓ Doing homework ✓ Participation in quizzes ✓ Participation in mid-term and final exams ✓ Presenting seminars ✓ Preparing reports 				
Required Learning Materials	For theoretical classes, all the lectures will be given with the aid of PowerPoint presentations. Students will have access to the handouts. The practical classes will take place in different material-testing laboratories.				
Evaluation	Task		Weight (Marks)	Due Week	Relevant Learning Outcome
	Assignments	Paper Review	-		
		Homework	5		
		Class Activity	2		
		Report	-		
		Seminar	5		
		Essay	5		
	Project	-			
Quiz		8			

	Lab. Reports	10		
	Midterm Exam	25		
	Final Exam	40		
	Total	100		
Specific learning outcome:	<ul style="list-style-type: none"> • By the end of Construction Materials course, the student shall be able to learn the principles of different construction materials, which are considered the backbone of any constructional project; • This course aims at providing Highway Engineering students with basic understanding of the Highway Engineering materials and the basic and fundamental design concept of highway pavement structures; • Students will be able to study and analyze different materials aided with required tests; • In addition, the students will be able to understand the basic elements of material properties. 			
Course References:	<ul style="list-style-type: none"> - Construction materials by Dr. Doran - Highway and traffic engineering 4th edition 2009 by Garber. - USA Asphalt institute 2006 - General specifications of Iraqi highway and bridges -2007 - ASTM annual book standard - Fundamentals of Building Construction: Materials and Methods by Edward Allen. 			
Course topics (Theory)		Week	Learning Outcome	
Introduction		1, 2	<ul style="list-style-type: none"> • Be informed about materials' historical backgrounds with some definitions and classifications; • Learn about different types of materials used in highway pavement construction; • Learn about the classification of materials types. 	
Structural matter		3	<ul style="list-style-type: none"> • Understand the structural composition of materials; • Learn about the determination of important characteristics (mechanical and physical properties) of materials which affect their performances. 	
Bond types in materials		4	Study bond types in materials and learn about their effects on mechanical and fracture properties.	
Mechanical properties		5	Study properties related to the strength of materials.	
Bricks types, ceramics, and tiles for construction , and soil types with required tests		6, 7	Learn about the different types of materials and their characteristics.	

Gypsum types used with required tests	8	Study types and advantages of gypsum for finishing.
Metals (steel, iron, and aluminum) , and wood types with required tests	9	Learn about different metal types and their characteristics.
Aggregate used in highway projects , with required tests	10	<ul style="list-style-type: none"> • Learn about the types and sources of paving aggregates; • Learn about the relevance of different properties of aggregates for pavement performance; • Learn about aggregates (fine and coarse) used in asphalt mixes and their gradations as well as calculations; • Learn about the trial and error method for determining a reasonable aggregate gradation in several stock piles. Blending of aggregate, with required tests; • Blending of different types of aggregates, with required tests.
Composite materials	11	Obtain desirable mixes with HAM, PCC with or without modified reinforcement for improvement.
Polymers and new technologies	12	Learn about different types of polymers and their application in construction project.
Practical Topics	Week	Learning Outcome
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	

Erbil Technology Institute							
Program: BSc. (135 ECTS)			2nd. Semester				
Total No. of Weeks/Semester:			16 weeks		Lecturer Name		
Department name: Highway & bridges Engineering				د. هه‌ورين حسن احمد			
Module Name:		CONSTRUCTION MATERIALS		Theory	Practical	Tutorial	
Module Code:		COM205	Group:	All	2	2	
ECTS Workload Calculation Form							
Activity	S	Description	Activity Type	No.	Time Factor	Workload	
Course	1	Theory	In class	f	12	2	24
	2		Online	f			
	3	Preparation (1.5)* Theory		h	12	2	24
	4	Practical		f	12	2	24
	5	Preparation (1)* practical		h	12	2	24
	6	Tutorial		f			
Site Visits		Scientific/Field Trips		f		2	
		Lab. Reports & Activities		f	4	1	4
Assignment	7	Homework		h	2	1	2
	8	Report		h	1	3	3
	9	Seminar		h	1	5	5
	10	Paper		h		12	
	11	Essay		h		8	
	12	Project		h		5	
Assessment	13	Quiz		h	2	1	2
	14	Mid Term	Theory	f	1	2	2
	15		Preparation	h	1	3	3
	16		Practical	f	1	1	1
	17		Preparation	h	1	3	3
	18	Final	Theory	f	1	2	2

	19	Preparation	h	1	6	6
	20	Practical	f	1	<u>2</u>	2
	21	Preparation	h	1	4	4
Face to face hours (f) / (12) week		4.92		Face to face hours (f)		59
Home hours (h) / (16) week		4.75		Home hours (h)		76
Total hours / (16) week		8.44		Total hours		135
ECTS (Total hours / 27) \approx 5						5

Underlined numbers must not be changed.

f: Face to face activity hours

h: Household activity hours

Examinations (question design):

- The examinations will be with multiple choice questions and/or true or false, and calculations;
- The exams will cover all the topics discussed in class;
- This is the first year the subject being taught by the lecturer. Therefore, next year, this course book will also contain a sample of final exam questions and answers.

External Evaluator

Checked and found satisfactory for the purpose of its use.

Sign here

Ahmed Suad Ali:

Head of QA/QC committee of Highway and Bridges Engineering Department 2019-2020/2020-2021/2021-2022/2022-2023