

## (Construction Materials ) Course Catalogue

### 2023-2024

<b>College</b>	Erbil Technical Engineering College	
<b>Department</b>	Highway & Bridges Engineering Department	
<b>Module Name</b>	Constructions Materials	
<b>Module Code</b>	COM205	
<b>Semester</b>	2 <sup>nd</sup>	
<b>Credit</b>	6	
<b>Module type</b>	Core	
<b>Weekly hours</b>	4	
<b>Weekly hours (Theory)</b>	(2)hr Class	
<b>Weekly hours (Practical)</b>	(2)hr lab.	
<b>Lecturer (Theory)</b>	Ass. Prof. Dr. Faris M. Jasim	
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## Course Book

### Course overview:

Increase student knowledge and learn the principles and practices for the investigation, design, contracting, and construction of different types of Highway Construction Materials, including more testing and studying processes for more durable with high performance active modern materials

- Highway Provide an educational experience of highest quality to our undergraduate and graduate students through a program of study that accommodates the individual's interests and career goals
- Provide a solid foundation for those students who wish to pursue graduate studies
- Maintain national and international leadership in advancing engineering knowledge through research and scholarship

Serve the engineering profession, industry, and University, the State, and society with valuable leadership, participation, and knowledge

### Course objective:

The main objectives to be achieved after the completion of this course are summarized below:

- 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

The students should be a viable during lecture time table when the student absent more Than the allowed hours the student will be dismissed. Students should be doing quizzes, practical reports, seasonal tests and final exams in order to able to collect required mark to success.

All students are required to fulfil the following requirements:

- Attendance
- Participation in problem solving and class activities
- Doing homework
- Participation in quiz

- Participation in exams
- Conducting projects
- Presenting seminars
- Preparing reports

### Forms of teaching

During lecturing the data show is used for showing lecture notes using power point program while the white board is used for explanation, tutorial videos and solving problems.

### Assessment scheme

- 16% Mid Exam
- 4% Quiz
- 40% Class Activity, Report, Homework, and Seminar
- 25% Final Exam practical
- 15% Final Exam practical

### Specific learning outcome:

By the end of the current course, the student shall be able to learn the major activities related to the highway materials which is the part that 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 study and analyse different materials aided with required tests with in addition, they will be able to understand the basic elements of material properties .

### Course Reading List and References:

- Construction materials by Dr. Doran
- Highway and traffic engineering 4<sup>th</sup> edition 2009 by Garber
- USA Asphalt institute 2006
- General specifications of Iraqi highway and bridges -2007
- ASTM annual book standard 1981-
- Fundamentals of Building Construction: Materials and Methods by Edward Allen
- مواد البناء الانشائية – يوسف دواف

- Course topics (Theory)	Week	Learning Outcome
Introduction	1,2	<ul style="list-style-type: none"> <li>• Be informed to a historical background with some definitions and Classifications.</li> <li>• Learn about different types of materials used in highway pavement construction.</li> <li>• Learn the classification of materials types .</li> </ul>
Structural matter	3	<ul style="list-style-type: none"> <li>• Understand the structural composition of materials</li> <li>• Learn about the determination of important characteristics like mechanical and physical properties which affect on construction</li> </ul>

		performance.
Bond types in materials	4	<ul style="list-style-type: none"> <li>• Study bond types in materials and learn about their effects on mechanical and fracture properties</li> </ul>
Mechanical properties	5	<ul style="list-style-type: none"> <li>• Study it that related to full components and their durability that is selected to be better one .</li> </ul>
Bricks types, ceramics, and tiles for construction , and soil types with required tests	6 7	<ul style="list-style-type: none"> <li>• Learn about the different typical and their characteristics which may affect performance, depending on their components , shape , size , raw matter .....</li> </ul>
Gypsum types used with required tests	8	<ul style="list-style-type: none"> <li>• Study types and their advantages for finishing as wall plaster and impervious types</li> </ul>
Metals ( steel, irons , and aluminum) , and wood types with required tests ,	9	<ul style="list-style-type: none"> <li>• Learn about the different typical and their characteristics which may affect performance, depending on their components , shape , size , materials sources .</li> </ul>
Mineral Aggregate Used in highway projects , with required tests	10	<ul style="list-style-type: none"> <li>• Learn about the types &amp; sources of paving aggregates</li> <li>• Learn about the relevance of different properties of these aggregates for pavement performance and their determination</li> <li>• Learn about mineral aggregates (coarse &amp; fine) used in asphalt mixes and their gradations as well as calculations.</li> </ul> <p>Appreciate the trial &amp; error method for determining a reasonable aggregate gradation in several stock piles.</p> <p>Blending of Aggregate, with required tests</p> <ul style="list-style-type: none"> <li>• Blending of different types of Aggregate, with required tests</li> </ul>
Composite materials	11	<ul style="list-style-type: none"> <li>• Obtain desirable mixes with study HAM,,PCC with or without modified ,, reinforcement for improvement</li> <li>• Single natural or quarried material not enough</li> <li>• Economical to combine natural and process materials.</li> </ul>
Polymers and new technologies	12	<ul style="list-style-type: none"> <li>• <b>Polymers</b>, both natural and synthetic, are created via <b>polymerization</b> of many small molecules, known as monomers. ... <b>Polymers</b> are <b>studied</b> in the fields of <b>polymer</b> science (which includes <b>polymer</b> chemistry and <b>polymer</b> physics), biophysics and materials</li> </ul>

science and engineering.

- **Examinations (question design):**


All questions are numerical and problem solving types. An example of a question paper and its solutions are attached at the end of this file.

- **Extra notes:**

Students can use internet for more explanation and getting extra examples.

- **External Evaluator**

I confirm that all syllabuses given in the attached course book is sufficient to covers required subjects, areas and titles needed for students.....



**Ass. Lecturer**  
**Bafrin Chalabi Zero**