KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Engineering Materials Syllabus			
Course Title	**Engineering Materials**		
Course Code	**CVE 3325C**	**No. of Credits**	**3 CH**
Department	**Civil and Environmental Departments**	**Faculty**	**Engineering**
Pre-requisites Course Code	**Strength of Materials**	**Co-requisites Course Code**	
Course Coordinator(s)	**Dr. Sabah Saadi Fayaed**		
Email	**sabah.saadi@komar.edu.iq**	**IP No.**	**238**
Other Course Teacher(s)/Tutor(s)	**Non**		
Learning Hours	**Monday And Wednesday (10:00 am-11:30 am)**		
Contact Hours	**Monday And Wednesday (8:30 am- 10:00 am)**		
Course Type	**Department Requirement**		
Offer in Academic Year	**Spring 2016**		

COURSE DESCRIPTION

This course provides a fundamental behavior and properties of various engineering materials. Topics include introduction to mechanical behavior of materials, characteristics of metals, evaluation of aggregates, design of Portland cement concrete and asphalt concrete. The style of this syllabus is adopted from Texas University.

COURSE OBJECTIVES

1. To understand the physical properties of major construction materials, and to be able to effectively evaluate, select and apply them in civil engineering practice.
2. To have hands-on experience with testing of construction materials.
3. To develop engineering ideas and effective skills of lab activities.

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COURSE LEARNING OUTCOME

After participating in the course, students would be able to:

1- Explain how different selected material components which can be added to concrete will affect the fresh and hardened properties of the concrete. **(ABET Outcome A)**

2- Describe the properties of production and properties for the civil engineering materials (Aluminum, steel, cement and concrete) **(ABET Outcome A)**

3- Construct and conduct experiments, as well as analyze and interpret data. **(ABET Outcome B and E)**

4- Design a concrete mixture to achieve specified design criteria. **(ABET Outcome C)**

Grading Scale:

Points	Percentage Scores
A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	75-79
C	70-74
C-	65-69
D+	60-64
D	55-59
D-	50-54
F	0-49
W	Withdrawal
I	Incomplete

Note: The minimum passing grade to pass this course is C-which is equivalent to 65%.

COURSE CONTENT

Course Topics Include:

Chapter 1: Materials Engineering Concepts
Chapter 3: Steel
Chapter 4: Aluminum
Chapter 5: Aggregates
Chapter 6: Portland Cement
Chapter 7: Portland Cement Concrete
Chapter 8: Masonry
Chapter 9: Asphalt and Asphalt Mixture
Chapter 11: Composites

COURSE TEACHING AND LEARNING ACTIVITIES

Course Teaching and Learning Activities:

1. Interactive class discussion
2. Hands- on Exercises
3. Practical Experiments
4. Home work
5. Mid Semester Exam, Tests and Quizzes

COURSE ASSESSMENT Tools

Assessment Tool	Description	Weight
Quizzes (5)	Quizzes are scheduled as shown in the semester schedule.	**10 %**
Mid-term	The mid-term will be conducted after week 7 of the semester.	**20 %**
Laboratory work	Laboratory experiments have been developed to coordinate with the content material.	**20 %**
Homework (2)	The H.W will be conducted during the semester.	**5 %**
Test	The Test will be conducted after week 12 of the semester.	**10 %**
Project	The project will be conducted in week 13 of the semester	**10 %**
Final Exam	The final exam will be conducted in week 16 of the semester	**25 %**

ESSENTIAL READINGS: (Journals, textbooks, website addresses etc.)

Textbooks:

Materials for Civil and Construction Engineers, 3rd edition, Mamlouk and Zaniewski ,Prentice Hall. ISBN: 0-13-611058-3.

References:

1- Design and Control of Concrete Mixtures. S. H. Kosmatka & M. L. Wilson 2011, 15th Edition, ISBN number: 0-89312-272-6

2- Foundations of Materials Science and Engineering 3rd Ed., W.F. Smith, McGraw Hill, 2004.

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Attendance Policy:

Students are expected to attend each class for the entire semester. Students are responsible for material present in lectures. Only students with official KUST absence, family crises, and illness are excused from class. Three occasions of lateness count as one absence. The student who misses 10 percent of the classes will be placed on probation.

Make up Policy:

Since all examination are announced in advance, zero grade will be given to any missed examination unless a student's has an acceptable reason, such as illness, for not being able to take the examination during all those days when the examination was announced.

Academic Dishonesty:

Any type of dishonesty (Plagiarism, Copying another's test or home-work, etc) will Not be tolerated. Students found guilty of any type of academic dishonesty are subject to failure in this course, plus further punishment by the University Consul.

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Course calendar: Please check the academic calendar for spring 2015

Week	Beg/End Dates	Topics (Chapters)	Course Assignments per chapter
1	(28-2 to 3-3) / 2016	**Chapter 1: Materials Engineering Concepts** • Mechanical Properties • Non-mechanical Properties	
2	(6-3 to 10-3) / 2016	**Chapter 3: Steel** • Steel Production • Mechanical test of Steel	**Quiz 1** (Ch.1)
3	(13-3 to 17-3) / 2016	**Chapter 4: Aluminum** • Aluminum Production • Welding and fastening	**Quiz 2** (Ch.3)
	(20-3 to 24-3) / 2016	**Nawroz Holiday**	
4	(27-3 to 31-3) / 2016	**Chapter 5: Aggregates** • Aggregate Sources **Experiment 1: Tension Test of steel**	**Report 1** Write a report to find out • Yield strength. • Ultimate strength. • Percentage elongation.
5	(3-4 to 7-4) / 2016	**Chapter 5: Continued** • Aggregate Properties	
6	(10-4 to 14-4) / 2016	**Chapter 6: Portland Cement** • Portland Cement Production **Experiment 2: Sieve analysis of Aggregates**	**Report 2** (Write a report about the particle size distribution of fine and coarse aggregates) **Quiz 3 (** Ch.4 and Ch.5)
7	(17-4 to 21-4)/ 2016	**Chapter 6: Continued** • Properties of Hydrated cement ✓ Setting ✓ soundness ✓ Compressive Strength	**Submitting "H.W 1"**
	(24-4 to 28-4) / 2016	**Mid-term**	**(Ch.1, Ch.3, Ch.4, Ch.5 and Ch.6)**
8	(1-5 to 5-5) / 2016	**Chapter 7: Portland Cement Concrete** • Properties of concrete Mixes • Mixing and handling Fresh Concrete • Curing Concrete	
9	(8-5 to 12-5) / 2016	**Chapter 7: Continued** • Properties of Hardened Concrete • Alternatives to conventional Concrete **Experiment 3:** • Slump of Freshly Mixed	**Quiz 4** (CH.7) **Report 3** (Write a report about the concrete mixed design and its effect on

		Portland cement concrete and • Compressive Strength of cube Concrete Specimens	compressive strength)
10	**(15-5 to 19-5) / 2016**	**Chapter 8: Masonry** • masonry Unite • Mortar • Plaster **Field trip:** Introduction to concrete masonry factory	**Report 4** (Write a report to explore the manufacturing process)
11	**(22-5 to 26-5) / 2016**	**Chapter 9: Asphalt and Asphalt Mixture** • Types of Asphalt Products • Characterization of Asphalt	**Submitting "H.W2"**
12	**(29-5 to 2-6) / 2016**	**Chapter 9: Continued** • Asphalt concrete Mix Design • Additives **Field trip:** Introduction to materials	**Report 5** (Write a report to the type and nature of the materials) **Quiz 5 (**Ch.8 and CH.9)
		TEST	**(Ch. 7, Ch. 8 and Ch.9)**
13	**(5-6 to 9-6) / 2016**	**Chapter 11: Composites** • Microscopic Composite	
14	**(12-6 to 16-6) / 2016**	**Chapter 11: Continued** • Properties of composite	
15	**(19-6 to 23-6) / 2016**	**Review Week for Academic Courses**	
16	**(26-6 to 30-6) / 2016**	**Final Examination for Academic Courses**	**All the Chapters**