KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Strength of Materials Syllabus			
Course Title	**Strength of Materials**		
Course Code	**CVE2315**	**No. of Credits**	**3 CH**
Department	**All Engineering Departments**	**Faculty**	**Engineering**
Pre-requisites Course Code	**Applied Mechanics: Statics & Dynamics (MEE2405)**	**Co-requisites Course Code**	
Course Coordinator(s)	**Dr. Ibrahiem Abdul Razak Al-Ani**		
Email	**Ibrahiem.abdulrazaq@komar.edu.iq**	**IP No.**	
Other Course Teacher(s)/Tutor(s)	**None**		
Learning Hours	**Section 1: Sunday (10:00 to 11:30) & Tuesday (10:00 to 11:30), Room 111** **Section 2: Sunday (14:00 to 15:30) & Tuesday (14:00 to 15:30), Room 105** **Section 3: Monday (12:00 to 1:30) & Wednesday (12:00 to 1:30), Room 105**		
Contact Hours	**Sunday (16:00 to 17:00), Monday (10:00 to 12:00), Thursday (9:00 to 2:00)**		
Course Type	**College Requirement**		
Offer in Academic Year	**Spring 2016**		

COURSE DESCRIPTION

This course provides the students with exposure to the systematic methods for solving engineering problems. Topics involved are introduction to the strength of materials, stress and strain, Poisons ratio and thermal expansion, pressure vessel and stress concentrations, properties of areas, torsion and round shafts, beam reactions, stresses in beams, beam deflection, and eventually beam design. Generally, it delivers an understanding of materials and structural components behavior in reaction to outside forces. This course style has been taken from Purdue University.

COURSE LEARNING OUTCOMES

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

1. Understand the basic concepts of strength of materials (normal stress, moment of inertia and beam reactions) [ABET Program Outcome A].
2. Solve simple engineering problems [ABET Program Outcome E].
3. Apply the types of failure modes, material property influence, and use of factors of safety or allowable stresses/strains on design [ABET Program Outcome E].
4. Demonstrate the reaction forces, moments; deflection and bending with shear stress

[ABET Program Outcome E].

5. Sketch shear and moment diagrams for designing the beam [ABET Program Outcome E].

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: Introduction to Strength of Materials
Chapter 2: Stress and Strain
Chapter 3: Poisson's Ratio and Thermal Expansion
Chapter 4: Pressure Vessels and Stress Concentrations
Chapter 5: Bolted and Welded Joints
Chapter 6: Properties of Areas
Chapter 7: Torsion in Round Shafts
Chapter 8: Beam Reactions, Shear Diagrams, and Moment Diagrams
Chapter 9: Stresses in Beams
Chapter 10: Beam Deflection
Chapter 11: Beam Design

COURSE TEACHING AND LEARNING ACTIVITIES

Course Teaching and Learning Activities: (short description)

1. Interactive class discussion
2. Hands- on Exercises
3. Assignments, Home work
4. Tests and Quizzes

COURSE ASSESSMENT TOOLS		
Assessment Tool	**Description**	**Weight**
Quizzes (4)	There will be four quizzes as scheduled in the course schedule.	10 %
Assignments (2)	Two assignments will be given at week 3 and week 13.	5 %
Midterm	The midterm exam will be conducted after week 7 that covers Chapters 1 to 6 as scheduled in the course schedule.	25 %
Project	Project to be performed on different topics in Strength of Materials	10 %
Test	There will be test after week 12 that covers Chapters 7-9.	20 %
Final Exam	The final exam will be conducted after week 15 that covers all the chapters started from Chapter 1 to Chapter 11.	30 %

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

References:

Textbook:
Dupen, B. (2012). Applied Strength of Materials for Engineering Technology. 2nd Edition. Indiana University, USA.

Other References

1- Hibbeler, R. C. Mechanics of Materials, 6th SI Edition, Prentice Hall.
2- Beer, F. P., Johnston, E.R., DeWolf, J. T. Mechanics of Materials, 4th Edition, McGraw Hill.

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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Note: Supplementary problems will be given either as homework in the text book and which are posted in the Google Classroom and during the class.

Week	Beg/End Dates	Topics (Chapters)	Course Assignments per chapter
1	**28-2 to 3-3 / 2016**	**Chapter 1: Introduction to Strength of Materials**	
2	**6-3 to 10-3 / 2016**	**Chapter 2: Stress and Strain** • Normal stress and strain • Sign convention • Shear stress and strain	
3	**13-3 to 17-3 / 2016**	**Chapter 3: Poisson's Ratio and Thermal Expansion** • Poisson's ratio • Thermal expansion & thermal stress	**Quiz 1**
4	**27-3 to 31-3 / 2016**	**Chapter 4: Pressure Vessels and Stress Concentrations** • Thin-Walled pressure vessels • Stress concentration in tension	**Assignment 1**
5	**3-4 to 7-4 / 2016**	**Chapter 5: Bolted and Welded Joints** • Bolted lap joints loaded in tension • Welded lap joints	
6	**10-4 to 17-4 / 2016**	**Chapter 6: Properties of Areas** • Dimensions and area • Moment of inertia • Hollow beams sharing a centroidal axis	**Quiz 2**
7	**17-4 to 21-4 / 2016**	**Chapter 6: properties of Areas** • Compound beams with different neutral axes • Hollow beams with different neutral axes • Radius of Gyration • Polar moment of inertia	

	22-4 to 28-4 / 2016	**Mid Term Exam**	
8	**2-5 to 5-5 / 2016**	**Chapter 7: Torsion in Round Shafts** • Shear stress in a round shaft • Angle of twist in a round shaft • Stress concentration in torsion	
9	**8-5 to 12-5 / 2016**	**Chapter 8: Beam Reactions, Shear Diagrams, and Moment Diagrams** • Loads on beams • Reactions for simply-supported simple beams • Reactions for overhanging and cantilever beams	
10	**15-5 to 19-5 / 2016**	**Chapter 8: Beam Reactions, Shear Diagrams, and Moment Diagrams** • Shear diagrams • Moment diagrams	**Quiz 3**
11	**22-5 to 26-5 / 2016**	**Chapter 9: Stresses in Beams** • Bending stress in beams • Bending stress in steel beams	
12	**29-5 to 2-6 / 2016**	**Chapter 9: Stresses in Beams** • Shear stress in beams • Allowable load	**Quiz 4**
		Test	
13	**5-6 to 9-6 / 2016**	**Chapter 10: Beam Deflection** • Radius of curvature • The formula method for simple cases	**Assignment 2** **Project Presentation**
14	**12-6 to 16-6 / 2016**	**Chapter 11: Beam Design** • Wide-flange steel beam design • Timber beam design	
15	**19-6 to 23-6 / 2016**	**Review Week for Academic Courses**	
16	**24-6 to 30-6 / 2016**	**Final Examination for Academic Courses**	