Module (Course Syllabus) Catalogue

2022-2023

College	**Erbil Technical Engineering College**	
Department	**Civil Engineering Department**	
Module Name	**Strength of materials- I**	
Module Code	**STM303**	
Degree	**Technical Diploma** ☐ **Bachler** ● **High Diploma** ☐ **Master** ☐ **PhD** ☐	
Semester	**3**	
Qualification	**BSc**	
Scientific Title	**Engineer**	
ECTS (Credits)	**6**	
Module type	**Prerequisite** ☐ **Core** ● **Assist.** ☐	
Weekly hours	**4**	
Weekly hours (Theory)	**(4) hr Class**	**(160) Total hrs Workload**
Weekly hours (Practical)	**( )hr Class**	**( )Total hrs Workload**
Number of Weeks	**12**	
Lecturer (Theory)	**Jamy Kh. Ahmed**	
E-Mail & Mobile NO.	**Jamy.ahmed@epu.edu.iq (07504334430)**	
Lecturer (Practical)		
E-Mail & Mobile NO.		
Websites		

Course Book

<table>
<tr><td>Course Description</td><td colspan="5">The subject introduces the most important topics of strength of materials. Chapter 1 begins with a review of the important concepts of statics, followed by a formal definition of both normal and shear stress, In Chapter 2 normal and shear strain are defined, and in Chapter 3 a discussion of some of the important mechanical properties of materials is given. Separate treatments of axial load, torsion, and bending are presented in Chapters 4, 5, and 6, respectively</td></tr>
<tr><td>Course objectives</td><td colspan="5">To provide basic knowledge in mechanics of materials so that the students can solve real engineering problems and design engineering systems.</td></tr>
<tr><td>Student's obligation</td><td colspan="5">1. Attendance at lectures is required.
2. Based on their real individual performance, students are graded. Students must provide evidence of their own knowledge and skills. It is not permissible to submit someone else's work, get or give unauthorized help (e. g. during tests or quizzes).</td></tr>
<tr><td>Required Learning Materials</td><td colspan="5"></td></tr>
<tr><td rowspan="10">Evaluation</td><td colspan="2">Task</td><td>Weight (Marks)</td><td>Due Week</td><td>Relevant Learning Outcome</td></tr>
<tr><td colspan="2">Paper Review</td><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td rowspan="6">Assignments</td><td>Homework</td><td>10%</td><td>8, 12</td><td>a, b, c</td></tr>
<tr><td>Class Activity</td><td>2%</td><td>N/A</td><td>a, b, c, d, e</td></tr>
<tr><td>Report</td><td>6%</td><td>12</td><td>N/A</td></tr>
<tr><td>Seminar</td><td>10%</td><td>7</td><td>a, b, c</td></tr>
<tr><td>Essay</td><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td>Project</td><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td colspan="2">Quiz</td><td>8%</td><td>12</td><td>a, b, c, d, e</td></tr>
<tr><td colspan="2">Lab.</td><td>N/A</td><td>N/A</td><td>N/A</td></tr>
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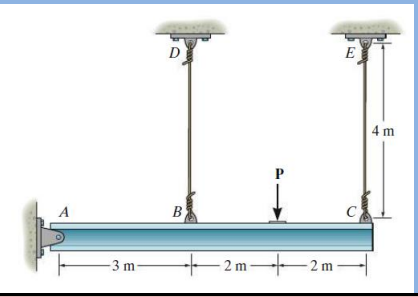
	Midterm Exam	24%	9	a, b, c, d
	Final Exam	40%	12	a, b, c, d, e
	Total	100%		
Specific learning outcome:	Upon successful completion of this subject, the student will be able to: a. understand the concepts of stress, strain and stress-strain relationship. b. Understand how a material behaves according to stress-strain curve. c. calculate the deformation of axially loaded members. d. calculate torsion stress of circular cross section and the angle of twist. e. establish shear and bending diagram, calculate bending stress.			
Course References:	Hibbeler, R.C., ***"Mechanics of Materials",*** 9th SI edition, Beer, Johnston & DeWolf, ***"Mechanics of Materials"***, 8th edition.			

Course topics (Theory)	**Week**	**Learning Outcome**
CH1. Stress Course book, Introduction, Equilibrium of a Deformable Body	1	a
Stress, Average Normal Stress	1	a
Average Shear Stress,	2	a
Allowable Stress design, Limit state design	2	a
CH2 Strain: Deformation, Strain	3	a, b
(Review problems) (Quizz1)	3	a, b
CH3 Mechanical properties of material: The stress-strain diagram, stress-strain behaviour of ductile and	4	a, b

brittle material		
Hooke's Law, strain energy	4	a, b
(Review problems) (Quizz2)	5	a, b
Poisson's ratio, the shear stress-strain diagram,	5	A, b
CH4 Axial load: Saint-Venant's Principle, Elastic deformation of an axially loaded member.	6	C
Principle of Superposition, Statically Indeterminate Axially loaded Member (Quizz3)	6	c
Seminar	7	A, b, c
The Force Method of analysis for Axially Loaded Member, Thermal Stress	8	c
CH5 Torsion: Torsional Deformation of a Circular Shaft, The Torsion Formula	8	d
Mid-term test	9	A, b, c, d
Angle of Twist, Statically Indeterminate Torque-Loaded Member	10	d
Solid Non-Circular Shaft, Thin-Wall Tubes Having Closed Cross Sections. (Quizz4)	10	d
CH6 Bending: Shear and Moment diagram, Graphical Method for Constructing Shear and Moment Diagram	11	e
Bending Deformation of a Straight Member, The Flexure Formula (Quizz5)	11	e
Consultation	12	
Practical Topics	**Week**	**Learning Outcome**

Questions Example Design

The rigid beam is supported by a pin at *A* and wires *BD* and *CE*. If the load P on the beam causes the end *C* to be displaced 10 mm downward, determine the *Normal strain* developed in wires *CE* and *BD*.



Extra notes:

External Evaluator