

Theoretical and practical course plan form - Ilam University of Medical Sciences

Introduction of static course and strength of materials in the second semester

School: Health

Department: Environmental Health

\* Course name and number: Static and material strength 4812011

\* Course and degree: Environmental Health Engineering

\* Day and time: Sunday 18-16, Sunday 16-14

\* Venue: Class 207 of the faculty

\* Name of the person in charge of the course (course instructor): Confirms the writers

\* Prerequisite courses: Math (1), Math (2), Differential equations

\* Office address:

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**General Objective of the course:** Familiarity of students with the study of the balance of rigid bodies and the application of its rules in certain static structures, the study of strength, ductility and stability of objects

• **Behavioral goals** (behavioral goals have an audience, behavioral verb, degree and criteria and conditions of performance)

1- Familiarity with the generalities of the lesson according to the topic

2- Mastering the theoretical aspect of static course and strength of materials

3- Solve problems

• **Student duties** (student homework during the semester)

Regular class attendance, class activities, problem solving

• **Main sources** (observing the principles of source writing and giving an address for their preparation, including library, bookstore, internet ...)

1- G: Eli. Maryam, L.; Craig. "Static", translated by Hassan Haghghi Tajour, University Publishing

2- Ferdinand, p. Beer, Russell Johnston "Material Resistance" Translated by Mohammad Reza Afsali, Majid Malekan, Sharif University of Technology

• **Teaching methods and teaching aids used:**

Student-centered, lecturing, group discussion, problem solving - whiteboard and magic

Method	Score	Date	Time
Solve problems and exercises	2	During semester	Class time

midterm	4		
Class activity, observance of discipline and discipline	1		
End of semester	13	End semester	

### Lesson rules and expectations from students

1- Regular and active presence in the class

2- Studying the materials related to the previous sessions to prepare for the class. 3- Doing the assigned homework

### Solid Mechanics Curriculum Schedule for the First Semester 2020-2021

Session	Time	Topic	Lecturer	Necessary preparation of students before the start of the class
1	14-16	Introduction to students - Presentation of topics and course resources - General explanations about the presented topics - How to teach and evaluation method	Dr.addiban	
2		Remind the principles of vector operations and problem solving		review previous session
3		Familiarity with the concepts of force, torque, coupling and problem solving		
4		Expressing theorems of torque, converting a force system to the minimum possible, equivalent force system, free volume diagram and problem solving		
5		Check the point equilibrium of matter and solve problems		
6		Check the balance of objects on the screen and solve problems		
7		Investigate the balance of objects in space and solve problems		
8		Identify stable, unstable, static and indeterminate static structures on the plane and in space and solve problems		
9		Solve two-dimensional trusses using analytical and graphical methods and solve problems		
10		Familiarity with space trusses and problem solving		
11		The concept of internal forces in certain static structures and the method of determining them and solving problems		
12		Geometric properties of curves, surfaces and volumes (center of shape, center of gravity, Golden and Papyrus theorems, moment of inertia, principal axes, Moore circle) and problem solving		
13		Virtual work theory and its application in solving balance problems and problem solving		
14		Understanding the force of friction and applying its laws in		

		statics and solving its problems		
15		Cable analysis and problem solving		
16		Familiarity with the subject of material strength and solving its problems		
17		Methods of drawing internal forces in linear members (axial, shear forces, bending anchors and torsional couplings) and solving its problems		
18		Defining stresses, transforming stresses, equilibrium differential equations and solving its problems		
19		Define action (relative deformation), strain conversion, adaptation relationships, and problem solving		
20		General relationships between stress and strain, members acting under pressure, Hooke rules, physical change, strain stress diagrams and problem solving		
21		Define elastic energy in objects and its general relations and solve its problems		
22		Criteria for material rupture and problem solving		
23		Twisting in members with circular sections and thin walls, familiarity with twisting in members with solid rectangular cross section and solving its problems		
24		Bending stresses in linear members and solving its problems		
25		The combination of pressure, tension, cutting, bending and twisting and solving its problems		
26		Deformation due to bending with integration methods and solving its problems		
27		Stability theory (buckling) in stressed members and solving its problems		