Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	**Erbil Technical Engineering College**	
Department	**Highway & Bridges Engineering Department**	
Module Name	**Engineering Mechanics-1**	
Module Code	**ENM102**	
Degree	**Technical Diploma** ☐ **Bachelor** ■ **High Diploma** ☐ **Master** ☐ **PhD** ☐	
Semester	**1st**	
Qualification		
Scientific Title	**Assistant Lecturer**	
ECTS (Credits)	**8**	
Module type	**Prerequisite** ☐ **Core** ■ **Assist.** ☐	
Weekly hours		
Weekly hours (Theory)	**(4)hr Class**	**(6)Total hrs Workload**
Weekly hours (Practical)	-	-
Number of Weeks	**16**	
Lecturer (Theory)	**Hana Sherzad Aziz**	
E-Mail & Mobile	**Hana.aziz@epu.edu.iq** **07504918619**	
Lecturer (Practical)		
E-Mail & Mobile		
Websites	**https://academicstaff.epu.edu.iq/faculty/hana.aziz**	

Course Book

Course Description	Mechanics is a branch of the **physical sciences** that is concerned with the State of rest or motion of bodies that are subjected to the action of forces. In general, this subject can be subdivided into three branches: **rigid-body mechanics, deformable-body mechanics, and fluid mechanics**. In this course, we will study rigid-body mechanics since it is a basic requirement for the study of the mechanics of deformable bodies and the mechanics of fluids. Furthermore, rigid-body mechanics is essential for the design and analysis of many types of structural members, mechanical components or electrical devices encountered in engineering. Rigid-body mechanics is divided into two areas: **statics and dynamics**. Statistics deals with the equilibrium of bodies, that is, those that either are at rest or move with a constant velocity; whereas dynamics is concerned with the accelerated motion of bodies. We can consider statics as a special case of dynamics, in which the acceleration is zero; however, statics deserves separate treatment in engineering education since many objects are designed with the intention that they remain in equilibrium.
Course objectives	❖ To present a general guide for solving problems ❖ To show how to add forces and resolve them into components ❖ To introduce the concept of the free-body diagram for a particle. ❖ To show how to solve particle equilibrium problems using the equations of equilibrium. ❖ To discuss the concept of the moment of a force and show how to calculate it in two and three dimensions. ❖ To provide a method for finding the moment of a force about a specified axis. ❖ To define the moment of a couple. ❖ To show how to determine the forces in the members of a truss using the method of joints and the method of sections. ❖ To present methods for determining the resultants of non-concurrent force systems.
Student's obligation	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

Required Learning Materials	lecture halls with data show equipment for lecture presentations, white board, overhead projector, posters				
Evaluation	**Task**		**Weight (Marks)**	**Due Week**	**Relevant Learning Outcome**
	Paper Review		0	0	
	Assignments	Homework	10	3	
		Class Activity	2	3	
		Report	8	1	
		Seminar	0	1	
		Essay	0	0	
		Project	8	1	
	Quiz		8	3	
	Lab.		0	0	
	Midterm Exam		24	2	
	Final Exam		40	2	
	Total		100	16	
Specific learning outcome:	1. Know fundamentals of structures and how they act 2. Recognize load types acting on structures 3. Understand how structures react to external loads 4. Know how important structures to stay in equilibrium 5. Be familiar with some types of structure such as trusses, towers and pulleys. 6. Deal with different types of structure supports 7. Strengthen themselves for the upcoming subjects in 2nd, 3rd and 4th year				
Course References:	➢ Engineering Mechanics (Statics) by R.C. Hibbeler ➢ Engineering Mechanics (Dynamics) by R.C. Hibbeler ➢ Engineering Mechanics by F.L. Singer ➢ Introduction to Statics & Dynamics by Andy Ruina & Rundra Pratap ➢ Engineering Mechanics by Higdon & Stiles ➢ Vector Mechanics for Engineers (statistics & Dynamics) by Beer, Johnston, Mazurek and Cornwell				

Course topics (Theory)	**Week**	**Learning Outcome**
Introduction to Mechanics	1	• The purpose, meaning and importance of Engineering Mechanics are introduced
General principles	2	• The basic quantities and idealizations of mechanics introduced. • The principles for applying the system of units reviewed. • A general guide for solving problems presented.

Forces	3	• How to add forces and resolve them into components are showed. • To indicate how to reduce a simple distributed loading to a resultant force having a specified location.
Moments	4	• The concept of the moment of a force discussed • Calculation of moments in two and three dimensions showed. • A method for finding the moment of a force about a specified axis provided
Couples	5	• The moment of a couple defined and calculated.
Resultant of force systems 2D	6	• Methods for finding the resultant of coplanar force systems presented (concurrent, parallel, no concurrent and no parallel).
Resultant of force systems 3D	7 8	• Methods for finding the resultant of non-coplanar force systems presented (concurrent, parallel, no concurrent and no parallel).
Equilibrium in 2D systems	9 10	• The concept of the free-body diagram for a body introduced. • The equations of equilibrium for a body developed. • Equilibrium problems solved using the equations of equilibrium.
Equilibrium in 3D systems	11 12	• The concept of the free-body diagram for a body introduced. • The equations of equilibrium for a body developed. • Equilibrium problems solved using the equations of equilibrium.
Practical Topics	**Week**	**Learning Outcome**
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

-	-	-
-	-	-
-	-	-

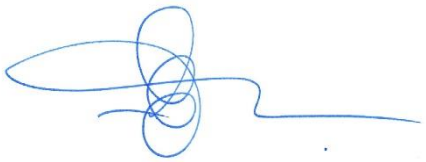
Questions Example Design

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:

External Evaluator

As an Assistant lecturer at Highway Department, I have revised the course-book regarding the subject of Engineering Mechanics for 1st stage, Department of Highway Engineering, Erbil Technical Engineering College. I found that the course-module catalogue has described well enough the aim and objectives of the subject. Moreover, it covers all the required syllabus and contents of the course and describes satisfactorily the aspects related to the course.



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