

## Faculty of Engineering & Technology

### Mechanics 1

#### Information :

**Course Code :** MEC 121                      **Level :** Undergraduate                      **Course Hours :** 2.00- Hours

**Department :** Faculty of Engineering & Technology

#### Instructor Information :

Title	Name	Office hours
Lecturer	Hamada Galal Taha Mohamed Askar	6
Lecturer	Hamada Galal Taha Mohamed Askar	6
Lecturer	Hamada Galal Taha Mohamed Askar	6
Assistant Lecturer	SHEROUK SOBHI ABDELSALAM FOU DA	
Assistant Lecturer	Noura Khedr Abdul raheem Ahmed	
Assistant Lecturer	SHEROUK SOBHI ABDELSALAM FOU DA	
Teaching Assistant	Mohamed Fathy Salem Mohamed	
Teaching Assistant	Ahmed Mohamed Abdelnaby Ali Shafay	
Teaching Assistant	Ahmed Muhammed Elmasbahy Abdel Samed	9

#### Area Of Study :

The main aim of this first course in mechanics is to develop in the engineering student the ability to analyze any problem in a simple and logical manner and to apply to its solution a few, well understood, basic principals. On successful completion of this course the student will be able to:

- 1- Know and understand vector analysis in two and three dimensions.
- 2- Apply vector mechanics to solve and analyze static problems.
- 3- Identify the reaction supports and draw the free body diagram.
- 4- Solve practical engineering applications in static involving the equilibrium of particles and rigid bodies under general force systems.

#### Description :

Applications on space vectors, Resultant of forces, Moment of a force, Equivalent couples, Equivalent systems, Equations of equilibrium of a rigid body, Types of supports, Equilibrium of plane systems (Trusses and frames), Equilibrium of space systems acting on rigid bodies, The mass center of a system of particles and laminas of different shapes, The mass moment of inertia of system of particles and laminas.

#### Course outcomes :

##### **a.Knowledge and Understanding: :**

1 -	Identify vector and scalar quantities in statics.
2 -	Perform all vector analysis operations.
3 -	Solve practical engineering problems of particles in static equilibrium.
4 -	Solve practical engineering problems of rigid bodies in static equilibrium.

**b. Intellectual Skills: :**

1 -	Deal with static problems.
2 -	Think logically and creatively.

**c. Professional and Practical Skills: :**

1 -	To gain skills in identifying and using all kinds of static principles and
2 -	To gain skills in applying all concepts of engineering mechanics.
3 -	To gain skills in constructing and using free-body diagrams to solve

**d. General and Transferable Skills: :**

1 -	- Gain the principle of quality of learning.
2 -	Develop skills related to creative thinking, problem solving, oral and

**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to mechanics	4	2	2
Statics of particles: forces in a plane.	4	2	2
Statics of particles: forces in a space.	4	2	2
Rigid bodies: external & internal forces, principle of transmissibility, vector product, moment of a force about a point, Varignon's theorem, rectangular components of the	4	2	2
Rigid bodies: scalar product of two vectors, mixed triple product of three vectors, moment of a force about a given axis.	4	2	2
1st Exam			
Rigid bodies: moment of a couple, equivalent couples, addition of couples, resolution of a given force into a force and a couple.	4	2	2
Rigid bodies: reduction of a system of forces to one force and one couple, equivalent systems of forces, equivalent systems of vectors.	4	2	2
Equilibrium of rigid bodies: free-body diagram, equilibrium in two dimensions	4	2	2
Equilibrium of rigid bodies: equilibrium in three dimension	4	2	2
2nd Exam			
Analysis of structures: analysis of trusses by method of joints	4	2	2
Analysis of structures: analysis of trusses by method of sections	4	2	2
Analysis of structures: frames, machines	4	2	2
Friction: dry friction	4	2	2
Final Exam			

**Teaching And Learning Methodologies :**

Lectures.
Tutorials.
Assignments and homework.
Discussions.

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
11th week evaluation	25.00	11	5.1- Oral discussion to asses the ability of following the lecture.
6th week evaluation (First exam + quiz)	15.00	6	5.1- Oral discussion to asses the ability of following the lecture.
Final-term examination	40.00	16	5.1- Oral discussion to asses the ability of following the lecture.
Semester performance(attendance +Assignment+quizzes)	20.00	1	5.1- Oral discussion to asses the ability of following the lecture.

**Course Notes :**

Course and instructor notes.

**Recommended books :**

Hibbeler, R.C., "ENGINEERING MECHANICS: PRINCIPLES OF STATICS AND DYNAMICS" Pearson Prentice Hall, 2006

**Periodicals :**

[www.mhhe.com/beer\\_johnston7](http://www.mhhe.com/beer_johnston7)  
[www.prenhall.com/onekey](http://www.prenhall.com/onekey)

**Web Sites :**

[www.mhhe.com/beer\\_johnston7](http://www.mhhe.com/beer_johnston7)  
[www.prenhall.com/onekey](http://www.prenhall.com/onekey)