FUTURE UNIVERSITY IN EGYPT
جامعة المستقبل

Faculty of Engineering & Technology

Mechanics 2

Information :

Course Code :	MEC 122	**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
Assistant Lecturer	Reham Milad Kamel Samaan	
Assistant Lecturer	Noura Khedr Abdul raheem Ahmed	

Area Of Study :

After completing this course, the student must be able to:

1. Understand the principles governing the motion of particles, velocity and acceleration.
2. Understand the principles of Newtonâs Second Law and its applications.
3. Understand kinetics of particles in particular energy and momentum methods.
4. Select the most appropriate of these techniques for solving a given problem.

Description :

Displacement, Velocity and Acceleration of a particle, Use of Cartesian coordinates to describe particle motion, Projectiles, Particle motion on straight paths, Trajectory equations, Rectangular and polar axes , Relative motion of two particles.
Newtonâs law of motion, Resistive media, Rocket motion as an application on variable mass particles, Simple harmonic motion of a particle, Motion on circular path, Principle of work and Kinetic energy, Conservative forces, Principle of conservation of mechanical energy, Principle of impulse and momentum.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	1. Use various methods of dynamics to solve problems
2 -	2. Develops the ability to use mathematics as a tool whereby the solution of any problem
3 -	3. Drawing free- body diagram and applying the relevant equations of mechanics
4 -	4. Identify the steps required to solve a problem in Mechanics
5 -	5. Use and transfer his knowledge on mechanics to some related projects
b.Intellectual Skills: :	
1 -	1. Apply appropriate theories, principles and concepts relevant to mechanics.
2 -	2. Think logically and creatively.

c.Professional and Practical Skills: :	
1 -	1. To gain skills in identifying and using the different mechanical rules related to this course
2 -	2. To gain skills in constructing the mechanical laws and be able to solve the dynamics problems
3 -	3. To gain skills to Ability to identify the problems
4 -	4. Collect physical phenomenon using methods learned in the course.
5 -	1. Plan practical activities using techniques and procedures a appropriate to mechanics.
d.General and Transferable Skills: :	
1 -	1. Work effectively in team.
2 -	2. Develop skills related to creations thinking, problem solving , oral and written presentation, and team work.
3 -	3. Deal with the ability to self appraise and reflect on practices relevant to mechanics.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Rectilinear Motion of particles: Position, Velocity, and Acceleration. Determination of the motion of a particle. Uniform Rectilinear motion. Uniformly Accelerated Rectilinear motion	8	4	4
Curvilinear Motion of Particles: Position, Velocity, and Acceleration. Rectangular components of velocity and acceleration. Motion of a projectile. Tangential and Normal components of velocity and acceleration	12	6	6
1st midterm			
Redial and Transverse components of velocity and acceleration.	4	2	2
Relative- motion analysis of two particles, system of pulleys.	8	4	4
Kinetic of Particle: Newton's Laws of Motion, The equations of motion, Equations of Motion: Rectangular Coordinates and Normal and Tangential Coordinates.	8	4	4
2nd midterm			
Kinetics of Particles: Energy and Momentum methods: Work of a force, Kinetic energy of a particle. Principle of work and energy and its application, Power and Efficiency , Potential Energy, Principle of Impulse and momentum, Impact	12	6	6
final exam			

Teaching And Learning Methodologies :

Lectures
Practical sections
Assignments and homework
Working models

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments and Quizzes	10.00	1	
Attendance	10.00	1	
Final Exam	40.00	16	
Mid-Term Exam 1	20.00	6	
Mid-Term Exam 2	20.00	12	

Course Notes :

course handouts & notes

Recommended books :

1-R. C. Hibbeler, " Engineering Mechanics (Dynamics)" ,PREENTICE HALL.

2-J. L. Meriam and L. G. Krige," Engineering Mechanics (Dynamics), 6th edition