Faculty of Engineering & Technology

Dynamics of Rigid Bodies (Mechanics3)

Information :

Course Code : MEC 221	**Level** : Undergraduate	**Course Hours :** 3.00- Hours

Department : Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Amr Mohamed Metwally Ismaiel	13
Lecturer	Amr Mohamed Metwally Ismaiel	13
Teaching Assistant	Amira Khaled Hasan Mohamed Elkodama	4
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Area Of Study :

Recognize the fundamental principles of kinematics of a rigid body.
Analyze the concepts of planar motion and its types (translation, rotation and general plane motion) of a rigid body or systems of connected bodies using vector and scalar methods.
Learn how to represent and apply relations of position, velocity and acceleration for rolling motion problems.
Study and analyze the various principles of Kinetics such as force-acceleration, work-energy and the impulse-momentum principles for various types of problems that containing the motion of a rigid body.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Describe position, velocity and acceleration for a moving rigid body.
2 -	Define the equations of motion of a rigid body
3 -	Explain the analysis of work and energy, impulse and momentum methods.

b.Intellectual Skills: :

1 -	Discriminate between different types of motion
2 -	Formulate the kinematic and kinetic equations in order to describe the motion of the rigid body.

c.Professional and Practical Skills: :

1 -	Design and perform experiments for motion studies.

d.General and Transferable Skills: :

1 -	Work effectively in a team and develop the skills which are related to creative thinking, problem solver, and teamwork in different fields of the motion of rigid bodies.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Planar kinematics of a rigid body, Translation, rotation and general motion	4	2	2
Vector and scalar methods for analysis of position, velocity and acceleration	8	4	4
Analysis of a mechanism of connected rigid bodied	4	2	2
Rolling motion and applications.	4	2	2
Kinetics of a rigid body	12	2	2
Force-acceleration method of a rigid body	12	6	6
Work . énergy method of a rigid body	12	6	6
Impulse and momentum method of a rigid body and impact problems	8	4	4
Midterm Exams and Quizzes	4	2	2

Teaching And Learning Methodologies :

Interactive Lecturing

Problem solving

Discussion

Research

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
1st -Mid-term examination	15.00	6	Written exam.
2 nd -Mid-term examination	15.00	11	Written exam.
Assignments, Participation, & Quizzes	30.00		Reports follow up during tutorial & written exam.
Final examination	40.00	15	Written exam.

Course Notes :

Lecture notes on the course moodle page, FUE website.

Recommended books :

"Engineering Mechanics . áDynamics" , By R.C. Hibbeler Publisher: Pearson

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