

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	Ahmed Ezzat Abd El Rahman Abd El Ghany	1

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.
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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.
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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

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
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 – energy 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 – Dynamics" , By R.C. Hibbeler Publisher: Pearson