

MENG233 – Rigid Body Dynamics

Eastern Mediterranean University
Faculty of Engineering

Department:

Mechanical Engineering

Program Name:

Mechanical Engineering

Program Code: 23

Course Code:

MENG233

Course Title:

Rigid body dynamics

Credits:

4 Cr

Year/Semester:

2017-2018 Fall

Area Core

Area Elective

Service Course

University Elective

Compulsory (offered by other academic units)

Prerequisite(s): MENG231 or CIVL211

Catalog Description:

The course covers:

Kinematics and Kinetics of Particles and Rigid Bodies.

Energy Methods.

Impulse and Momentum.

Un-Damped Vibration of Single and Two-Degree of Freedom Systems.

Instructor Name:

Assoc. Prof. Dr. Qasim Zeeshan

Office no:

ME141

Office Tel:

0392 630 1361

Course Web Page:

<http://me.emu.edu.tr/zeeshan/meng233.htm>

Textbook(s):

- R. C. Hibbeler, Engineering Mechanics – Dynamics, 10th. Edition.
- Ferdinand P. Beer E. Russel Johnston, Jr. and Phillip J. Cornwell, Vector Mechanics for Engineers - Dynamics, 9th. Edition in SI units, Mc Graw Hill.

Indicative Basic Reading List :**Topics Covered and Class Schedule:**

(4 hours of lectures, 1 hour of tutorial and 1 hour of lab work per week)

Weeks 1-4 Kinematics of particles

Week 5 Kinetics of particles (Force and Acceleration)

Week 6 Kinetics of particles (Work and Energy)

Weeks 7 Kinetics of particles (Impulse and Momentum)

Weeks 8-9 **Midterm Examination**

Week 10 Plane Kinematics of Rigid Bodies

Week 11 Plane Kinetics of Rigid Bodies (Force and Acceleration)

Week 12 Plane Kinetics of Rigid Bodies (Work and Energy)

Week 13 Plane Kinetics of Rigid Bodies (Impulse and Momentum)

Week 14 Vibrations

Week 15 **Final Examination**

Lecture and Tutorial Learning Outcome	Student Outcomes	Performed Assessments and Percentage
<ul style="list-style-type: none"> Understand the principles of Newton's laws and their application to the real life physical problems that require knowledge of the relationship between force and motion. Ability to draw free body diagrams Understand and use the vector concepts to describe the motion of particles and rigid bodies Understand the concepts of kinetic, potential and mechanical energies. Understand the concepts of work, energy, power and mechanical efficiency Develop the analytical skills needed to systematically formulate, solve, and analyze a wide range of dynamics problems. Develop equations of motion for simple systems of particles and rigid bodies Model dynamics problems consisting of mechanical systems composed of rigid components. 	a, h, e	HWs: 5% Essay: 5% Project: 5% Quizzes: 5% Midterm Exam: 30% Final Examination: 45%

Lab. Experiment Title and Lab. Equipment Used	Lab Learning Outcome	Student Outcomes	Performed Assessments and Percentage
<ul style="list-style-type: none"> Conservation of Momentum Measurement of Static and Kinetic Coefficients of Friction 		b	Lab Works %5

Student Outcomes

<input checked="" type="checkbox"/>	a) Ability to apply mathematics, science and engineering principles.
<input checked="" type="checkbox"/>	b) Ability to design and conduct experiments, analyze and interpret data.
<input type="checkbox"/>	c) Ability to design a system, component, or process to meet desired needs.
<input type="checkbox"/>	d) Ability to function on multidisciplinary teams.
<input checked="" type="checkbox"/>	e) Ability to identify, formulate and solve engineering problems.
<input type="checkbox"/>	f) Understanding of professional and ethical responsibility.
<input type="checkbox"/>	g) Ability to communicate effectively.
<input checked="" type="checkbox"/>	h) The broad education necessary to understand the impact of engineering solutions in a global and societal context.
<input type="checkbox"/>	i) Recognition of the need for and an ability to engage in life-long learning.
<input type="checkbox"/>	j) Knowledge of contemporary issues.
<input type="checkbox"/>	k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Contribution of Course to Criterion 5

Credit Hours for:

Mathematics & Basic Science : 0

Engineering Sciences and Design : 4

General Education : 0

Important Notes:

University rules and regulations are applied to this course.