ENME 232 Dynamics: 3 Credit Hours.

Prerequisites: ENCE 232 Statics

Instructors: **Sima Rishmawi, MSc**   Aggad 314   srishmawi@birzeit.edu

Section 1	SW	11:25-12:40	Aggad 311
Section 2	SW	12:50-2:05	Aggad 311
Section 3	TR	11:25-12:40	Aggad 332

Textbook:

Engineering Mechanics: Dynamics, R.C Hibbler, Prentice Hall. Thirteenth Edition.

References

F., Beer and E., Johnston, Vector Mechanics for Engineers – Dynamics, Mc Graw-Hill, 1977.

Joseph Shelley. Schaum's Series – Vector mechanics for engineers Volume II – Dynamics, McGraw-Hill, 1991.

ABET SOs:

(a) An ability to apply knowledge of mathematics, science, and engineering.
(e) An ability to identify, formulate, and solve engineering problems.

Course Description:

Kinematics of particles, absolute and relative motion, coordinate systems, fixed and moving ones, Newton's Laws, linear impulse and momentum, energy and work, angular momentum, motion of rigid bodies, and Euler's equations.

Objectives:

This course aims at studying the absolute and relative motion of particles and rigid bodies in different coordinate systems. During course work, the student will learn to apply Newton's Laws to solve various dynamic problems. The course will also cover other topics including Impulse, and Linear and Angular Momentum. Finally, the student will be able to apply Work and Energy Methods as an alternative approach to solve dynamic problems.

Grading:

Quizzes	15%
First Exam	20%
Second Exam	25%
Final Exam	40%

Attendance: Students are required to attend all classes unless extraordinary circumstances occur, and must ask or inform the instructor. Any student who skips five classes including the first day will be dropped from the class. This includes late registration students. Any absences on exam days without informing the instructor beforehand or contacting next day will be unacceptable excuse even with a medical report. Also, there is no make-up for missed quizzes.

Topics:

1- Kinematics of a Particle (12.1, 12.2, 12.4 – 12.10)
2- Kinetics of a Particle: Force and Acceleration (13.1-13.6)
3- Kinetics of a Particle: Work and Energy (14.1-14.3, 14.5, 14.6)
4- Kinetics of a Particle: Impulse and Momentum (15.1-15.7)
5- Planar Kinematics of a Rigid Body (16.1-16.8)
6- Planar Kinetics of a Rigid Body: Force and Acceleration (17.1-17.5)
7- Planar Kinetics of a Rigid Body: Work and Energy (18.1-18.5)
8- Planar Kinetics of a Rigid Body: Impulse and Momentum (19.1-19.4)

Extra:

You are not allowed to contact me through Social Media. I do not reply to any form of communication except Ritaj and my E-mail.

Proposed exercises from textbook:

Chapter 12: Kinematics of a Particle: [(10, 22, 32, 76, 78, 89, 98, 109), (120, 130, 142, 147, 153, 167, 170, 181, 185, 194), (198, 203, 208, 213, 219, 225, 229)].

Chapter 13: Kinetics of a Particle: Force and Acceleration: [6, 18, 26, 36, 41, 59, 62, 69, 70, 89, 93, 100].

Chapter 14: Kinetics of a Particle: Work and Energy: [4, 13, 16, 19, 20, 24, 37, 71, 73, 76, 93].

Chapter 15: Kinetics of a Particle: Impulse and Momentum: [7, 10, 23, 25, 36, 40, 57, 61, 64, 69, 77, 82, 88, 105, 107, 108].

Chapter 16: Planar Kinematics of a Rigid Body: [(5, 9, 18, 31, 44, 48, 53), (59, 65, 72, 81, 89, 92, 95, 107), (112, 124, 127, 131, 137, 143, 148, 159)].

Chapter 17: Force and Acceleration: [(12, 15, 21, 30, 42, 46, 48, 53), (59, 81, 85, 90, 95, 105, 112, 115, 119)].

Chapter 18: Work and Energy: [(2, 9, 16, 26, 32, 41, 44, 65, 67)].

Chapter 19: Impulse and Momentum: [(4, 8, 10, 16, 36, 40, 46, 52)].

"There are no secrets to success. It is the result of preparation, hard work, and learning from failure." - Colin Powell