جامعة الشرقية
A' SHARQIYAH UNIVERSITY

Course Descriptor
ENGR321 Dynamics

ACADEMIC YEAR	2019-20	**SEMESTER**	Spring
Course Code	ENGR 321	**Course Title**	Dynamics
Credit hours	3	**Level of study**	Undergraduate
College / Centre	Engineering	**Department**	CVEN
Co-requisites		**Pre-requisites**	ENGR 220

1. COURSE OUTLINE

[This course discusses the fundamental principles of engineering mechanics: dynamics. Topics covered include kinematics and kinetics of a particle, work and energy, and impulse and momentum.

2. AIMS

[The course provides students with basic concepts and theories in dynamics and application of these concepts within engineering problems.

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes ***(Definitive)*** Upon successful completion of this course, students will be able to**:**	**Teaching and Learning methods** ***(Indicative)***	**Assessment** ***(Indicative)***
1. Understand the basic principles underlying the dynamics of particle and rigid body	Lectures	Assignments and Examinations
2. Identify, formulate, and solve engineering problems in dynamics	Lectures	Assignments and Examinations
3. Gain a basic understanding of the concepts of work-energy and impulse-momentum of particle and rigid body	Lectures	Assignments and Examinations
4.		

4. ASSESSMENT WEIGHTING

Assessment	**Percentage of final mark (%)**
1st Examination	20
2nd Examination	20
Assignments	40
Final Examination	20
TOTAL	**100%**

5. ACHIEVING A PASS

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Students will achieve 3 credit hours for this course by passing **ALL** of the course assessments and achieving a **minimum overall score of 50%.**

NB *Ensure that ALL learning outcomes are taken into account

6. COURSE CONTENT (Indicative)

WEEK	LECTURE TOPIC	TIME (HOURS)
1	Introduction	1.5
	Kinematics of a particle: rectilinear kinematics	1.5
2	Kinematics of a particle: rectilinear kinematics	1.5
	Kinematics of a particle: general curvilinear motion	1.5
3	Kinematics of a particle: rectangular components	1.5
	Kinematics of a particle: motion of a projectile	1.5
4	Kinematics of a particle: normal and tangential components	1.5
	Kinematics of a particle: summary	1.5
5	Kinetics of a particle: Newton's second law of motion	1.5
	Kinetics of a particle: the equation of motion	1.5
6	Kinetics of a particle: equation of motion for a system of particles	1.5
	Kinetics of a particle: rectangular coordinates	1.5
7	Kinetics of a particle: rectangular coordinates	1.5
	Kinetics of a particle: normal and tangential coordinates	1.5
8	Kinetics of a particle: normal and tangential coordinates	1.5
	Kinetics of a particle: summary	1.5
9	Work and energy: work of a force	1.5
	Work and energy: principle of work and energy	1.5
10	Work and energy: principle of work and energy	1.5
	Work and energy: power and efficiency	1.5
11	Work and energy: conservative forces and potential energy	1.5
	Work and energy: conservation of energy	1.5
12	Impulse and momentum: principle of linear impulse and momentum	1.5
	Impulse and momentum: principle of linear impulse and momentum	1.5
13	Impulse and momentum: conservation of linear momentum	1.5
	Impulse and momentum: conservation of linear momentum	1.5
14	Impulse and momentum: impact	1.5
	Impulse and momentum: angular momentum	1.5
15	Impulse and momentum: summary	1.5
	Summary	1.5
	TOTAL HOURS	**45**
1 - 15	Plus **RECOMMENDED INDEPENDENT STUDY HOURS**	
	TOTAL COURSE HOURS	**45**

7. RECOMMENDED READING

Core text/s:
Engineering Mechanics: Dynamics, R.C. Hibbeler, 12th edition, Pearson, 2010
Library + online resources: