DEPARTMENT OF MECHANICAL ENGINEERING
PRODUCTION AND MECHANICAL SYSTEMS DESIGN PROGRAM
COURSE SYLLABUS

MENG 262: Engineering Mechanics (Dynamics)

COURSE TITLE	ENGLISH CODE/NO	ARABIC CODE/NO.	CREDITS			
			Th.	Pr.	Tr.	Total
Engineering Mechanics (Dynamics)	MENG 262	هـ مك 262	3	1		3
Pre-requisites:	CE 201					
Course Role in Curriculum *(Required/Elective):*	Required course					
Catalogue Description: Review of particle motion. Rotation and translation of a rigid body in the plane. General motion. Displacement, velocity, and acceleration of rigid bodies, including Coriolis motion. Motion about a fixed point. Equations of motion for a rigid body. Constrained plane motion. Work and energy. Impulse and momentum. Gyroscopic motion. Introduction to mechanical vibrations.						

***Textbooks*:** *(Author, Title, Pub., year)* Meriam J. L., Kraige, L. G., Engineering Mechanics: Dynamics, 6th Edition, 2008, John Wiley

***Supplemental Materials*:**

1. Vector Mechanics for Engineers, Dynamics, 7th Edition, F. B. Beer, E. R. Johnston, W. L. Clausen, McGraw Hill, 2003.
2. Engineering Mechanics: Dynamics, 1st Computational Edition, R. W. Soutas-Little, D. J. Inman, CL-Engineering, 2007.
3. Engineering Mechanics: Dynamics. 12th Edition, R. C. Hibbeler, Prentice Hall, 2009.
4. Vectorial Engineering Dynamics, M. Akyurt, A. K. El-Kalay, A. R. M. Mannaa, A. M Abuelnaga, F. Abulkarim, Hafiz House Publisher & Distributor, 1992.

***Course Learning Outcomes*:**

By the completion of the course the students should be able to:

1. Define Newton's Laws for motion
2. Perform kinematic analysis of particles in different coordinate systems such as Cartesian, polar and normal-tangential coordinates
3. Perform kinetic analysis of particles through the use of Newton's Second Law.
4. Perform kinetic analysis of particles through the use of energy concepts.
5. Perform kinetic analysis of particles through the use of impulse-momentum principles
6. Perform planar kinematic analysis of rigid bodies in rotation and/or translation
7. Perform kinetic analysis of rigid bodies and mechanisms through the use of Newton's

Second Law
8. Perform kinetic analysis of rigid bodies through the use of energy concepts
9. Perform kinetic analysis of rigid bodies through the use of impulse-momentum concepts
10. Perform free vibration analysis of particles

Topics to be Covered:	***Duration in Weeks***
1. Newton's Laws of Motion	1
2. Kinematics of Particles	3
3. Kinetics of Particles	3
4. Plane Kinematics of Rigid Bodies	3
5. Plane Kinetics of Rigid Bodies	3
6. Free Vibration of Particles	1

Key Student Outcomes addressed by the course: (Put a ✓ sign)

(a)	an ability to apply knowledge of mathematics, science, and engineering	✓
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	✓
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

Key Student Outcomes assessed in the course: (a) and (e)

Instructor or course coordinator: Dr. Ramzi Othman
Last updated: Spring 2014