Arab Academy for Science, Technology & Maritime Transport
College of Engineering & Technology
Department of Basic and Applied Science

University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: **BA 142**	Course Title: **Mechanics II**		Academic Year/Level: **1st** year / **2nd** semester
Specialization:	No. of Instructional Units	Lecture	Practical
	3 Credits	**2hrs.**	**2hrs.**

2- Course Aim

To provide the student with a clear and thorough presentation of the theory and applications of engineering mechanics.

3- Intended Learning Outcome (ILO's)

a- Knowledge and Understanding	K1) Concepts and theories of mathematics and sciences, appropriate to the discipline. a1 .Recognize the concepts of particle motion with variable acceleration a2. Identify the principle and rules of projectile a3. State newton's law of motion. a4. Classify the various types of rigid body planar motion. a5. Define general plane motion. a6. Define the relative analysis velocity and acceleration a7. Identify the mass moment of inertia
b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. **b1**. Calculate the veliocty, acceleration and displacement of particle motion along a straight line at a given instant. **b2** Evaluate the kinematical properties of a projectile **b3** Apply equations of motion to solve the kinetics problems of particle. **b4.** Apply the theorem of conservation of energy to solve kinetics particle problems. **b5**. Analyze motion about fixed axis. **b6**. Calculate velocity and acceleration of members. **b7**. Discuss applications of equations to bodies undergoing rotational motion. **b8**. Apply the theorem of conservation of energy to solve kinetics rigid body problems.

c- Professional and Practical Skills	P1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. **c1**. Use free bodies diagrams analyses to simplify and solve the kinetics problems of particle. **c2**. Apply the equations of motion and principle work and energy to solve the kinetics problems of rigid body
d- General Skills	G6) Effectively manage tasks, time, and resources. **d1**. Check the ability of the students to decompose applied problems and get an analytical solution in a specified time by short quiz.

4- Course Content

Lecture		
Wk	Hrs	Description
1	2	Kinematics of a particle – Rectilinear Kinematics.
2	2	Curvilinear motion : Rectangular components, projectile motion.
3	2	Force and acceleration (Kinetics), Newton's laws.
4	2	Work and energy of a particle (kinetics)
5	2	Rotation of a rigid body about a fixed axis.
6	2	General plane motion.
7	2	7^{th} week exam.
8	2	Relative motion: velocity.
9	2	Relative motion: acceleration
10	2	Planar Kinetics of a rigid body: Equation of translational motion
11	2	Equation of rotational motion.
12	2	12^{th} week exam.
13	2	Equation of General plane motion
14	2	Work and Energy
15	2	Review
16	2	Final Exam

5- Teaching and Learning Methods

1. Lectures
2. Tutorials
3. Individual and group coursework
4. Project group technical reports
5. Individual and group projects

6- Teaching and Learning Methods for Students with Special Needs

1. Consulting with lecturer during office ours
2. Consulting with teaching assistant during office hours.
3. An academic supervisor is appointed for handicapped students. Constant follow ups are done for handicapped students after each assessment to evaluate their academic level of achievement.

7- Student Assessment

a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. 2. Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills.
b- Schedule:	Assessment 1: 7th Week Written Exam Assessment 2: 12th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 0 % Practical Examination : 0 % Semester Work : 10 % Total : 100%

8- List of References:

a- Course Notes	Prepared by lecturer
b- Required Books (Textbooks)	R.C Hibbeler "Engineering Mechanics Dynamics " 12th. edition, Prentice Hall, 2010.
c- Recommended Books	F.B. Beer and E.R. Johnston " Vector Mechanics for Engineering" , 9th. edition , Mcgraw Hill , 2009.
d- Periodicals, Web Sites, ..., etc.	

Course coordinator: **Program Manager:**