Model No.12
Course Specifications (2014-2015)
Engineering Mechanics and Theory of Machines

University: Benha University
Faculty: Faculty of Engineering at Shoubra
Department offering the program: Mechanical Engineering Department
Department offering the course: Mechanical Engineering Department

1- Course Data

Course Code: MDP114

Course Title: Engineering Mechanics and Theory of Machines

Specialization: Mechanical Production Engineering

Course Type: Compulsory   **Study Year:** First year

Teaching Hours: Lecture: 2

Tutorial/ Practical: 2   Total: 4

2- Course Aim

For students undertaking this course, the aims are to:

1. Develop the capacity to predict the effects of force and motion in the course of carrying out the creative design function of engineering.

3-Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding skills:

On completing this course, students will be able to demonstrate the knowledge and understanding of:

a.1) Defining and list the concepts and theories of mechanics and theory of machines. (A1)

a.2) Characteristics of kinetic of particles. (A3)

a.3) Methodologies of solving theory of machines problems. (A5)

a.4) identifying the basic theories and principles of kinetic of rigid bodies. (A4)

b- Intellectual Skills

At the end of this course, the students will be able to**:**

b.1) Select suitable approaches of solving theory of machines problems. (B1)

b.2) Think in a creative and innovative way in theory of machines problem solving. (B4, B5)

b.3) Investigate the failure of components, systems, and processes of machines. (B6)

b.4) Solve engineering mechanics and theory of machines problems, often on the basis of limited and possibly contradicting information. (B7)

c- Professional Skills

On completing this course, the students are expected to be able to*:*

c.1) Apply knowledge and identifying the machines mechanisms and parts to solve theory of machines. (C1)

c.2) Create and/or design machine for specified application. (C3)

d- General Skills
At the end of this course, the students will be able to*:*

d.1) Understand the mechanisms and component of any machines and identifying its components velocity and acceleration. (D7)

4-Course Contents:

Week no.	Topics
1	Kinematics of particles: rectilinear motion
2	Kinematics of particles: Curvilinear motion, system of coordinates.
3	Kinetic of particles: basic equations of dynamics, equation of motion
4	Kinetic of particles: Kinetic energy and work, potential energy.
5	Kinetic of particles: Impulse and momentum, impact.
6	Kinematics of rigid bodies: rotation, absolute motion, relative velocity
7	Kinematics of rigid bodies: Instantaneous center of zero velocity and acceleration.
8	Kinetics of rigid bodies: force, mass, acceleration.
9	Kinetics of rigid bodies: work, energy and impulse. Conservation of energy and momentum.
10	Kinetics of rigid bodies: Conservation of energy and momentum.
11	Kinetics of rigid bodies: general equations of motion.
12	Kinetics of rigid bodies: general plane Motion, Impulse and momentum.
13	Introduction to vibration

5- Teaching and Learning Methods
5.1- Lectures.
5.2- Tutorials.
5.3- Class activity.
5.4- Assignments/homework.

6- Teaching and Learning Methods of Disables
No.

7- Student Assessment
a- Student Assessment Methods
1.   Five assignments to assess   knowledge and intellectual skills.
2.   Four quizzes   to assess   knowledge, intellectual and professional skills.
3.   Mid-term exam   to assess   knowledge, intellectual, professional and general skills.
4.   Final exam   to assess   knowledge, intellectual, professional and general skills.

b- Assessment Schedule

No.	Assessment	Week
1	Assignments	2, 3, 5, 7, and 9
2	Quizzes	4, 6, 10, 12
3	Mid-term exam	8
4	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Mid-Term Examination	20 %
Final-Term Examination	70 %
Semester work	5 %
Other types of assessment	5 %
Total	100 %

8- List of References

a- Course Notes

1- Course notes prepared by instructor.

b- Books

1- Engineering Mechanics (Dynamics), R.C. Hibbeler, 6th edition, Macmillan Publishing.

c- Recommended Books

1- Engineering Mechanics. (Dynamics), By: J.L. Merian., form edition. John Wiley & Sons. Inc.

2- Vector mechanics for Engineers (Dynamics), By: Beer and Johnson.

3- Elements of statics and dynamics, By: S.L.Long.

Course Coordinator: Dr. Abdelsalam Hemaid

Head of Department: Prof. Dr. Osama Ezzat Abdullatif

Model No.11A
Course Specifications: engineering mechanics and theory of machines

University: Benha University
Faculty: Faculty of Engineering at Shoubra
Department offering the program: Mechanical Engineering Department
Department offering the course: Mechanical Engineering Department

Matrix of Knowledge and Skills of the course

No.	Topics	week	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Kinematics of particles: rectilinear motion	1	a1, a2			
2	Kinematics of particles: Curvilinear motion, system of coordinates.	2		b4		
3	Kinetic of particles: basic equations of dynamics, equation of motion	3		b1, b2		
4	Kinetic of particles: Kinetic energy and work, potential energy.	4	a3		c1	
5	Kinetic of particles: Impulse and momentum, impact.	5		b1, b2		
6	Kinematics of rigid bodies: rotation, absolute motion, relative velocity	6	a3		c1	
7	Kinematics of rigid bodies: Instantaneous center of zero velocity and acceleration.	7	a2			d1
8	Kinetics of rigid bodies: force, mass, acceleration.	9	a1, a2	b1		
9	Kinetics of rigid bodies: work, energy and impulse. Conservation of energy and momentum.	10	a3, a4	b2		
10	Kinetics of rigid bodies: Conservation of energy and momentum.	11			c2	d2
11	Kinetics of rigid bodies: general equations of motion.	12		b3, b4		d1
12	Kinetics of rigid bodies: general plane Motion. Impulse and momentum.	13			c2	d2
13	Introduction to vibration	14	a4	b3		d2

Course Coordinator: Dr. Abdelsalam Hemaid

Head of Department: Prof. Dr. Osama Ezzat Abdullatif

Matrix of course aims and ILO's

Course Title: Engineering Mechanics Theory of Machines

Course Code: MDP114

Teaching Hours: Lecture: 2   Tutorial: 2   Total: 4

Major or minor element of program: Major

Program on which the course is given: B.Sc. Mechanical Production Engineering

Department offering the program: Mechanical Engineering Department

Department offering the course: Mechanical Engineering Department

Academic year / level: 2014-2015 First Year / first semester

Date of specifications approval: 2014

Course aims	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
Develop the capacity to predict the effects of force and motion in the course of carrying out the creative design function of engineering.	a1, a3	b1, b2, b4	c1	d1

Course Coordinator: Dr. Abdelsalam Hemaid

Head of Department: Prof. Dr. Osama Ezzat Abdullatif