University: Menoufiya University

College: Faculty of Electronic Engineering

Department: Physics and Engineering Mathematics

Course Specification

١- Course basic information		
Course Code: PM٠٠٥	**Course Title:** **Mechanics**	**Academic year: ٢٠١٢-٢٠١٣** **preparatory year** **Level (٠) – Semester: ٢**
Department requirement **Faculty requirement** **University requirement**	**Teaching hours: Lecture (٤)** **Tutorial (٢)**	
٢- Aim of the Course		
	• **Understand the principles, facts and concepts of the Dynamics.** • **Understand the point motion in a straight line and its applications.** • **Understand the point motion in a plane and its applications.** • **Understand Batch movement and collision.**	
٣- Intended Learning Outcomes		
A- Knowledge and Understanding	**a١) Concepts and theories of mathematics and science appropriate to engineering applications.** **a٢) Basics of information and communication technology (ICT).** **a٣) Characteristics of engineering materials related to industrial electronics and control engineering.** **a٥) Methodologies of solving engineering problems, data collection and interpretation.** **a١٠) Technical language and report writing.**	

	a١١) Professional ethics and impacts of engineering solutions on society and environment. a١٢) Contemporary engineering topics.
B- Intellectual Skills	b١) Select appropriate mathematical and computer based methods for modeling and analyzing problems. b٢) Select appropriate solutions for engineering problems based on analytical thinking. b٣) Think in a creative and innovative way in problem solving. b٤) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. b٧) Solve engineering problems, often on the basis of limited and possibly contradicting information. b٨) Select and appraise appropriate ICT tools to a variety of engineering problems. b١١) Analyze results of numerical models and assess their limitations. b١٢) Create systematic and methodic approaches when dealing with new and advancing technology.
C- Professional Skills	c١) Apply knowledge of mathematics, science, and engineering practice integrally to solve engineering problems. c٦) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs c٧) Apply numerical modeling methods to engineering problems. c١١) Exchange knowledge and skills with engineering community and industry. c١٢) Prepare and present technical reports.
D- General Skills	d٢) Work in stressful environment and within

	constraints. d٣) Communicate effectively. d٥) Lead and motivate individuals. d٨) Acquire entrepreneurial skills. d٩) Refer to relevant literatures.
٤- Course Contents	
	Vectors – multiplication – moments – equilibrium in space – trusses analysis – virtual work – center of mass – moment of inertia – linear motion of particles – S.H.M – planer motion of particles in Cartesian co-ordinates– projectiles – motion in resistive medium – velocity and acceleration in polar co-ordinates- circular motion – dynamics of charged particles in magnetic and electric fields – impulse and collision – dynamics of rigid body.
٥- Teaching and Learning Methods	
	• Lectures • Tutorials
٦- Teaching and Learning Methods for disable students	
	• case studies • Research assignments
٧- Student Assessment	
a- Assessment Methods	- Weekly sheet exercises at class room. - Quizzes. - case study for more demonstration. - Mid term and final exams.
b- Assessment Schedule	- Exercise sheet Weekly - Mid–Term exam: Week no ٧ - Quiz –١: Week no ١٠ - Final – term examination: Week no ١٣

c- Weighting of Assessment	**- Mid-term examination: ٢٠ %** **- Case study: ٥ %** **- Final – term examination: ٦٥ %** **- Other types of assessment: ٥ %** **Total ١٠٠ %**
٨- List of text books and references:	
a- Course notes	**• The dynamics of Preparatory students of engineering colleges.** **• Lecturer Notes prepared by Prof. Dr. Emil Shoukralla .**
b- Text books	**•Vector Mechanics for Engineers: Dynamics, Seventh Edition, by F. P. Beer, E.** **•R. Johnson, and William E. Clausen, published by McGraw-Hill (١٩٩٣).**
c- Recommended books	**•Principles of Dynamics, ١٠e, Russell C Hibbeler, Hibbeler OneKEY--A** **• complete system for mechanics courses. www.prenhall.com/onekey, ٢٠٠٥** **•Engineering Mechanics: Dynamics SI+Study Pack, Anthony M Bedford ٢٠٠٥**
d- Periodicals, Web sites ……etc	**•http://emntserver.unl.edu/NEGAHBAN/EM٣٧٣/Intro.htm** **•Hibbeler OneKEY,A complete system for mechanics courses.** **•www.prenhall.com/onekey**

Course contents - ILOs Matrix

Content Topics	Week	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
Vectors – multiplication	٢	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٤ b٧	c١ – c٦ – c١١	d٢ – d٣ – d٩
moments – equilibrium in space	١	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٤ b٧	c١ – c٦ – c١١	d٢ – d٣ – d٥ d٨ – d٩
trusses analysis	١	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٤ b٨	c١ – c٦ – c١١	d٢ – d٣ – d٥ d٨ – d٩
virtual work	١	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٤ b٨	c١ – c٦ – c١١	d٢ – d٣ – d٥ d٨ – d٩
center of mass	١	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٤ b٨	c١ – c٦ – c١١	d٢ – d٣ – d٥ d٨ – d٩
moment of inertia	١	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٧	c١ – c٦ – c١١	d٢ – d٣ – d٩
linear motion of particles	١	a١ – a٥ – a١٢	b٢ – b٣ – b٧	c١ – c٦	d٢ – d٣ – d٩
The simple harmonic motion – the motion in the resistive field	١	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٤ b٧	c١ – c٦ – c١١	d٢ – d٣ – d٥ d٨ – d٩
planer motion of particles in Cartesian co-ordinates– projectiles	٢	a١ – a٥ – a١١ a١٢	b٢ – b٣ – b٤ b٨	c١ – c٦ – c١١	d٢ – d٣ – d٥ d٨ – d٩
velocity and acceleration in polar co-ordinates-The circular motion	١	a١ – a٥ – a١٢	b٢ – b٣ – b٤ b٨	c١ – c٦	d٢ – d٣ – d٥ d٨ – d٩

Impulse and collision– dynamics of rigid body	٢	a١ – a٣ – a٥ a١١ – a١٢	b٢ – b٣ – b٤ b٧ – b٨ – b١٢	c١ – c٦ – c١١	d٢ – d٣ – d٥ d٨ – d٩

Course coordinator:
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Prof. Dr. Emil Shoukralla
Prof. Dr. Magdy Kamel
Dr. Ramadan El-Shanawany

Head of Department:
Prof. Dr. Magdi Kamel

Date: / /