



Thin Client Technology for Improved Learning of Mathematics



(TCTILM)
D-088-IO

Mathematics Dept.

Activity Name	Reconstruction of the Contents of Math/CS Level 1 Courses. (12 Courses)		Activity Code***:	I.A.2
Starting Date	(16/7/05)	Duration	(12) Weeks	End Date: (30/10/05)

Course Specification

A. Basic Information:

Course Title and Code	Mechanics (i) Dynamics 122 M
Hours per Week	2 Lect. + 2 Exer.
Academic Year	2005 – 2006
Semester	Second Semester

B. Professional Information:

Aims	1.	Be familiar with the basic concepts of dynamics.
	2.	Understand and learn the concept of kinematics and kinetics of a particle
	3.	Understand the relative motion in plane and its applications.
	4.	Be familiar with motion of a projectile in a plane.
	5.	Apply the concepts of all the previous concepts for solving some physical and engineering problems.

Contents		
Subject	No. of Hours	
	Lecture	Tutorial
1. Kinematics of a particle motion in a straight line: (Fundamental definitions and principles- Graphical representation of the variables of motions – Applications).	2	2
2. Kinematics of a particle motion in a plane: (Components of velocity and acceleration in Cartesian, Polar and Intrinsic coordinates – Motion on a circle – Applications).	4	4
3. Relative motion in a plane: (Relative position – Relative velocity – Relative acceleration – Relative angular velocity – Applications)	2	2
4. Kinetics of a Particle: (definition of force and momentum- Newton’s laws – Unites and dimensions -Types of forces – Impulse and momentum – Work and kinetic energy – Potential energy - Principal of conservation of energy - Applications).	4	4
5. Simple harmonic motion(S.H.M.): (Definitions and fundamental equations – composition of two S.H.M.s - The simple pendulum – Second pendulum – Examples).	2	2
6. Projectiles: (motion of a projectile – Project on a horizontal plane (time of flight, range and path)- Project on an inclined plane – Maximum path of a projectile - Examples).	4	4
7. Motion in a circle: (Motion in a vertical circle conditioned from one and two side -	2	2

Motion in a horizontal circle - Examples).		
8. Impact of elastic bodies: (Direct impact of two spheres – Impact on a fixed smooth plane – Oblique impact of two spheres - Examples).	2	2
9. Central Orbits: (Definitions – Planetary orbits – Kepler’s laws –Examples).	4	4
10 Using course ware to illustrate some examples using computer..	2	2

<i>Prerequisites</i>	
1. Mechanics (i) Statics (121 M)	
2. Calculus I and II (Math 101 and 102)	

Mid-Term Exam	Practical Exam	Final-Term Exam
Week (8)	--	Week (15)

Tutorial activities and homework	Mid-Term Exam	Practical Exam	Final-Term exam
5%	15%	--	80%

<i>List of References</i>	
(I) Course Notes Prepared by Staff Members of Mathematics Dept.	
(II) Text Books	1. Vector Mechanics for Engineers: Dynamics, Seventh Edition, by F. P. Beer, E. R. Johnson, and William E. Clausen, published by McGraw-Hill (1993).
	2. Principles of Dynamics, 10e, Russell C Hibbeler, Hibbeler OneKEY--A complete system for mechanics courses. www.prenhall.com/onekey , 2005
	3. Engineering Mechanics: Dynamics SI+Study Pack, Anthony M Bedford, 2005
(III) Web Sites	1. http://em-ntserver.unl.edu/NEGAHBAN/EM373/Intro.htm
	2. Hibbeler OneKEY,A complete system for mechanics courses. www.prenhall.com/onekey
	3. The Word of Mathematical Equations: http://eqworld.ipmnet.ru/

<i>Facilities Required for Teaching and Learning</i>
1. Good Sound System, especially in large class rooms
2. Over head projector and data show
3. Library furnished with lots of computers

<i>Course Committee</i>	
Name	Signature
1. Prof. Dr. Mahmoud S. El-Boghdadi	
2. Dr. Fouad S. Ibrahim	
3. Dr. Adel S. Hana	
4. Assistant Staff Amad H. Ahmed	

Project Manager



Prof. Dr. Ahmed A. Allam

Date 1 / 11/ 2005