



University of Management and Technology

School of Science and Technology

Department of Basic Sciences

Course Code NS-124

Course Title: APPLIED PHYSICS

Program: BS-EE

Course Outline (Fall Semester 2013)

Schedule	Monday----Saturday	Pre-requisite	Nil
Course Coordinator	Zaheer Hussain Shah	Contact	zaheer.hussain@umt.edu.pk bsc.cod@umt.edu.pk
Course Description	<p>Vectors and Scalars , Components of vectors , Multiplying vectors, Scalar product, Vector product ,Coulomb’s law, electric field due to a single charge and distribution of charges, electric flux and Gauss’s law, electric potential due to a single charge and distribution of charges, capacitance and dielectrics, current and resistances, direct current circuits, Kirchoff’s rules, RC circuits, magnetic field and forces, Biot-Savart law, Ampere’s law, Faraday’s law of induction, inductance, alternating current circuits, RL circuits, LC circuits and RLC circuits.</p> <p>The learning in this course is strengthened by applications of all topics and related lab work.</p>		
Expected Outcomes	<p>Participants will learn calculus based general physics approach. The overall goal is to use the scientific method to come to understand the enormous variety of electromagnetic phenomena in terms of a few relatively simple laws.</p>		
<p>Text Book # 1: College Physics with an integrated approach to Forces and Kinematics, Giambattista Richardson, Fourth edition 2013</p> <p>Text Book # 2: Fundamentals of Physics, Halliday/Resnick/Walker, Sixth edition 2006</p>			
Assignment & Projects	<p>i). Problems will be assigned at regular intervals as an assignment.</p> <p>ii). Projects on different topics may also be assigned to the students.</p> <p>Marks will be deducted for late submission.</p>	Quizzes	<p>All quizzes will be announced well before time.</p> <p>No make-ups will be offered for missed quizzes.</p>
Mid Term Examination	<p>A 60-minutes exam will cover all the material covered during the first 14-16 lectures.</p> <p>Combined Mid Term exam for all multiple sections.</p>	Final Examination	<p>A 120-minutes exam will cover all the material covered during the semester.</p> <p>Combined Final exam for all multiple sections.</p>
Attendance Policy	<p>Students missing more than 20% of the lectures will receive an “SA” grade in the course and will not be allowed to take final exam.</p>		

Grading Policy	Assignment +Projects+ Quizzes:	20%
	Mid Term Examination:	30%
	Final Examination:	50%



NS-124 Applied Physics

Lecture Plan (Fall 2013)

Week	Lecture #	TOPICS	CH	SECTIONS
1	1	Vectors and Scalars , Addition of vectors,	3	1 – 2
	2	Addition of vectors (continued) Book # 2	3	3
2	1	Unit Vectors, , The laws of physics	3	4 – 6
	2	Multiplying vectors Book # 2	3	7
3	1	Electric charge and Coulomb's Law	16	1 – 3
	2	The Electric field of point charge Book # 1	16	4
4	1	Motion of a charged particle in uniform electric field	16	5 – 6
	2	Gauss's Law for electric fields Book # 1	16	4
5	1	Electric potential energy, Electric potential	17	1 – 2
	2	Applications of electric potential Book # 1	17	2 – 3
6	1	Conservation of energy for moving charges	17	4 – 5
	2	Capacitors , Energy stored in a capacitor Book # 1	17	6 – 7
7	1	Electric current, Emf	18	1 - 3
	2	Resistance and Resistivity , Series and Parallel circuits Book # 1	18	4 - 6
8	1	Kirchhoff's Rules	18	7
	2	Power and energy in circuits Book # 1	18	8 - 9
9	1	RC circuits	18	10 – 11
	2	Magnetic fields , Magnetic force on a point charge Book # 1	19	1 - 2
10	1	Charged particle moving perpendicularly to a uniform magnetic field	19	3– 4
	2	Magnetic force on a current-carrying wire Book # 1	19	5 – 6
11	1	Torque on a current loop	19	7 – 8
	2	Magnetic field due to a circular current loop, Ampère's Law Book # 1	19	8 – 10

12	1	Motional emf , Electric generators	20	1 – 2
	2	Faraday's law , Lenz's law Book # 1	20	3 – 4
13	1	Back emf in a motor , Transformers	20	5 – 7
	2	Mutual and Self-Inductance , LR Circuits Book # 1	20	8 – 10
14	1	Resistors in ac circuits, Capacitors in ac circuits	21	1 – 3
	2	Inductors in ac circuits , RLC series circuits Book # 1	21	4 – 5
15	1	Resonance in an RLC circuit, Converting ac to dc	21	6 – 7
	2	Revision Book # 1		