Course specification

University/Academy: Damanhour

Faculty/Institute: Science

Department: Physics

1. course Data:		
Course code: PHY (104)	**Course title:** General physics	**Academicyear/level:** 2007/2008 1st year /second term
Specialization: Biological science group	**No. of instructional units:** lecture 4hrs tutorial 1hrs practical 3hrs	

2. course Aim	• The course introduces students the basic physical quantities, standard units and dimensional analysis. Also it introduces some physical concept in properties of matter and their uses in daily life. • The course provides to the phenomena associated with heat and its effect on materials and phase transformations. • The course provides the students to the fundamentals of vibrations and different modes of waves. • The course introduces the students to the nature and the theories of light .Also students have to recognize the fundamentals of light reflection and refraction at different surfaces and applications of them in connection with optical instruments.

	• It provides basics in classical aspects of the propagation of light and, introduces basic concepts in geometrical optics. • The course introduces the fundamental laws of electricity and magnetism, the ability to apply electricity and magnetism concepts in different sciences and to develop techniques used in the solution of simple field problems.
3. Intended learning outcome	
a) Knowledge and understanding	A1: Define the concept of heat as a form of energy together with concept of temperature and its measurements. A2: Recognize the Basic physical quantities and dimensional analysis with emphasis on validation of basic physical relations and how to deduce basic physical relation, Elasticity of materials and Fluids dynamics. A3: Define the Simple harmonic motion and their applications, Free, forced and resonant vibrations and Wave motion characteristics, types of waves. A4: Recognize nature of theories of light. A5: Describe the propagation of light in free space and lens/mirror systems. A6: Define the basic laws of electricity and magnetism. A7: Define a systematic analysis method to calculate Currents and voltages in dc circuits.
b) Intellectual skills	B1: Determine the properties of simple heat systems. B2**:** Create ray diagrams for use in solving simple heat problems. B3: Discuss the theoretical principles of simple Vibrations &

	Waves systems. B4: Determine the properties of simple heat systems. B5: Create ray diagrams for use in solving simple geometrical optics problems. B6: Analyze the theoretical principles of basic electricity and magnetism.
c) Professional skills	C1: Use instrument appropriate software package to analyse quantitative date. C2: Examine Practice appropriate heat experiments and sampling program in the laboratory. C3: Explain the principles of and limitation of practical techniques. C4: Examine Practice appropriate geometrical optics experiments and sampling program in the laboratory. C5 : Use instrument in laboratory. C6: Dissect the skills requiring the application of mathematical techniques and the basic principles of electricity and magnetism.
d) General skills	D1: Use of technology tools: - use the internet/electronic resources to obtain subject specific information,. - use a number of computer packages to present information. D2: The ability to work in goups: work with other as a part of a team to collect data and/or to produce reports and presentations. D3: Write reports improving Self-learning: - study independently, set realistic targets and plan work and time to met targets within deadlines. D4: Write reports and Problem solving: - Regular problem

	exercises and example will give students the chance to develop their theoretical understanding and problem. D5: The ability to communicate: Students will have write reports and give oral presentation.
4. course content	- BASIC DEFINITIONS AND UNITS. - Dimensional analysis and application, Relation between force, work and potential energy. - Simple Harmonic Motion and Energy of vibration. -The nature and propagation of light, theories of light and reflection and refraction at plane surfaces. -Electric Fields and Gauss`s Law. - Heat and Thermodynamics , Kinetic Theory and Specific Heat. - Elasticity, Plastic behaviour , Isotropic materials and Elastic energy. - Oscillation with one and two degrees of freedom and Linearity and superposition principle. -Derivation of the laws of reflection and refraction from corpuscular principle and Huygen's principle, Snell's law and total reflection.. - Electric Potential and Capacitance and Dielectrics. Behaviour Under Applied Heat and Thermal expansion of solids and Liquids. - Hydrostatics and Surface Tension. - Simple and compound pendulum, Simple harmonic oscillation of a mass between springs and of loaded spring and Composition of two simple harmonic oscillations. - Refraction by a prism, Dispersion, Rain bow, Brewster's law and Plane mirror, Spherical surface. - Capacitors with Dielectrics, Electric Dipole in an Electric Field, An Atomic Description of Dielectrics and Electric Current, Resistance and Ohm`s Law. - Effect of heat on materials: Change of state (phase rule and phase diagram). - Surface energy, Pressure inside a soap bubble and a liquid drop, Capillarity and Negative pressure and the cohesion of water. - Free, forced and resonant vibration. -Reflection and refraction of spherical waves at surfaces and

	spherical wave. - A Model For Electric Conduction, Resistance and Temperature, Superconductors, Electric Energy and Power. - change in size (thermal expansion with some applications and anamolous behavior of water) and thermal stresses and change in colour. - Microscopic Considerations for the Study of Properties of Matter,Properties of fluids, Fluid dynamics and Viscosity. - Damped and un-damped vibration and What does propagate in wave motion? - Thin lenses and Thick lenses. - Electromotive Force, Resistors in Series and in Parallel. - HEAT TRANSFER Radiation Conduction Convection and thermal conductivity. - Diffusion , osmotic phenomenon and the gravitational force. Inertial and gravitational mass. - Characteristics of wave motion: Transverse and Longitudinal wave motion and differential equation of wave motion. - Lens Aberrations and Camera. -The Magnetic Field, Magnetic Force Acting on a Current-Carrying Conductor, Torque on a Current Loop in a Uniform Magnetic Field and Motion of a Charged Particle in a Uniform Magnetic Field. - Motion of satellites and planetary orbits,Use of gravitational potential energy and Escape speed. - Particle and wave velocities, Distribution of velocities and pressure wave and energy of Progressive wave. - The eye, Microscopes and Telescopes. - The Biot Savart Law, Ampere's Law, The Magnetic Field of a Solenoid,Gauss's Law in Magnetism, Displacement Current and the Generalized Ampere's Law, Faraday's Law of Induction, Motional EMF, Lenz's Law.
5. Teaching and learning methods	5.1. lecture using PowerPoint presentations. 5.2. practical sections. 5.3. independent reading throughout basic text books and

	research papers.
6. teaching and learning methods for students with special needs	Data show – computer – blackboard – Student oral presentations
7. Student Assessment	7-1. Semester Work. 7-2. Mid-Term Examination . 7-3. Practical Examination 7-4. Final Term Examination
a) Procedures used:	7.1. Reaserch and presentation to assess skills of presenting data and discussion. 7.2. Mid-Term Examination To accesses ability to continue in course 7.3. practical exam. To access professional and practical skills. 7.4. written exam. To accesses ability to remember &.understand scientific background.
b) Schedule:	Assessment1:Semesterwork Week: 4-8 Assessment 2: Mid-term Week: 10 Assessment 3: Practical final Week: 12 Assessment 4: Written final Week: 14
c) Weighing of Assessment:	Mid-Term Examination: 10 Final-Term Examination: 150 Practical Examination: 30 Semester Work: 10

	Total: 200
8. List of Textbooks and References:	----------
a) Course Notes	Lecturer private notes
b) Required Books (Textbooks)	1- Book 4 in the Light and Matter series of free introductory physics textbooks Copyright c2002-2004 Benjamin Crowell All rights reserved. rev. April 1, 2006 2- " Physics Principles with applications ", D.C Giancoli, USA. 3- " University physics", F.W. Sears, M.W. Zemasky and H.D. Young,Wesley series in physics, USA
c) Recommended Books	1- Feynman Lectures on Physics Volumes 1,2,3 - Feynman, Leighton and Sands 2-" Physics for Scientists and Engineering ", F.W Sears and R.J Beichner, Saunders college publishing.
d) Periodicals, web sites,…,etc	http://www.physics.upenn.edu/courses/gladney/phys151/lectures/lecture_apr_14_2003.shtml http://members.tripod.com/~IgorIvanov/physics/optics-geom.html- *http://www.mip.berkeley.edu/physics/bookddx.html* *http://technorati.com/videos/youtube.com%2Fwatch%3Fv%3DWxitGR-9qGA* http://www.phy.duke.edu/courses/

Course Instructor: Dr. Hussien Ali Mutaweh
Dr. Dr. Nadia Abd-Elaty
Dr. Yehya keshk

Head of Department

Date: -----/-----/-

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Prof. Dr. El. M. Elmaghrby