Course specification

University/Academy: Damanhour

Faculty/Institute: Science

Department: Physics

1. course Data:		
Course code: PHY (321)	Course title: Electrodynamics and Theory of Relativity	Academic year/level: 2009/2010 3rd year (first term)
Specialization: Math. & physics Chem.& physics	No. of instructional units: lecture 2hrs/ week tutorial 1 practical -	

2. course Aim	• The course introduces the students to the principles of the special theory of relativity. • The course introduces the principles of the electrodynamics and its application.
3. Intended learning outcome	
a) Knowledge and understanding	**A1**: Define Maxwell's equation. **A2**: Recognize the difference between Galilean and Lorentz transformations **A3**: Describe the length contraction time dilation. liquids, diffusion and osmotic phenomenon.
b) Intellectual skills	B1: Analyze scientific problems logically. B2: Show the difference between Galilean and Lorentz transformations.

	B3: Apply the laws governing the electrodynamics.
c) Professional skills	C1: Conduct the physical knowledge to analyze a suitable technique to solve problems. C2: Dissect some physical problems helping in understanding the course parts.
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 groups: 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	- Maxwell's equation . - Frame of references- Galilean transformations. - Electromagnetic waves in free space. - Michelson & Morley Exp- Lorentz trans . - Elementary electrodynamics and application. - Electric and magnetic dipoles and electromagnetism. - Length contraction and time dilation - transformation of velocity and acceleration.

	- Gauge transformations. - Boundary value problems in electrodynamics. - Relativistic mass- total energy and potential energy
5. Teaching and learning methods	5.1. Teaching will be by lectures, exercises . 5.2. All learning outcomes are delivered through lectures. 5.3.All lectures and worked examples are given from the lecturer private notes. Instructional Methods include: • Direct Instruction: lecture, reading, in class research, problem sets, presentations, and guest speakers • Instructional Materials: textbook; primary and secondary materials, experts from the field, and electronic media • Team Teaching which will include business, university, and community based partners • Community based applied concept projects • Self-directed, cooperative, and collaborative learning projects • Student oral presentations
6. teaching and learning methods for students with special needs	1- Over head projector 2- appropriate teaching accommodation and Computers 3- Laboratory with computer terminal.
7. Student Assessment	**7-1.** Semester Work. **7-2.** Mid-Term Examination .

	7-3. **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. 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: Written final Week: 14
c) Weighing of Assessment:	Mid-Term Examination: --- Final-Term Examination: 100 Semester Work: --- Total: 100
8. List of Textbooks and References:	----------
a) Course Notes	Lecturer private notes
b) Required Books (Textbooks)	1. **University Physics with Modern Physics (12th edition,** 2000) 2. **Perspectives of Modern Physics, Arthur Beiser, McGraw-Hill,1969.** 3. **Physics, Part-I, Serway.** 4. **Physics, Part-I, E.Gettys, J.Keller** 5. **Book 4 in the Light and Matter series of free introductory physics textbooks**

c) Recommended Books	1. **Copyright c2002-2004 Benjamin Crowell All rights reserved. rev. April 1, 2006** 2. Feynman Lectures on Physics Volumes 1,2,3 - Feynman, Leighton and Sands
d) Periodicals, web sites,…,etc	**http://electrodynam.com/rc/** **http://www.plasma.uu.se/CED/Book/** **http://electron6.phys.utk.edu/phys594/Tools/e&m/summary/** **electrodynamics.htm** **http://hyperphysics.phy-astr.gsu.edu/Hbase/forces/qed.html** **http://www-radiophys.univer.kharkov.ua/electrodyn/** **http://encyclopedia.farlex.com/Quantum+electro-dynamics** **www.google.com** **www.rapidshare.com** **www.megashare.com**

Course Instructor: Dr /aymn el okapy

Head of Department

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

Prof. Dr. El. M. Elmaghrby