Course specification

University/Academy: Damanhour

Faculty/Institute: Science

Department: Physics

1. course Data:		
Course code: PHY (310)	Course title: Quantum mechanics (1)	Academic year/level: 2009-2010 3rd year (second term)
Specialization: Special physics	No. of instructional units: lecture 4hrs/ week tutorial 2hrs/ week	

2. course Aim	The course introduces the students to the principles of classical mechanics as an introduction to study quantum mechanics and its applications.
3. Intended learning outcome	
a) Knowledge and understanding	**A1**: Understand the origin of quantum mechanics. **A2**: Recognize the wave function and energy spectrum. **A3**: Understand Schrödinger equation.
b) Intellectual skills	B1: Apply Schrödinger equation for solving many physical problems. B2: Analyze the physical meaning of surrounding problems.
c) Professional skills	C1: Solving some physical problems helping in understanding the course parts.

	C2: Use the physical knowledge to analyze a suitable technique to solve problems.
d) General skills	D1: IT skills: - use the internet/electronic resources to obtain subject specific information,. - use a number of computer packages to present information. D2: Working with others: work with other as a part of a team to collect data and/or to produce reports and presentations. D3: Self-learning: - study independently, set realistic targets and plan work and time to met targets within deadlines. D4: Prpblem solving: - Regular problem exercises and example will give students the chance to develop their theoretical understanding and problem. D5: Communication: Students will have write reports and give oral presentation.
4. course content	Origin of QM-Black body radiation. Photoelectric effect. Compton effect. The wave function and uncertainly. Time dependent of Schrödinger. Time independent of Schrödinger. One dimensional examples.
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: 25 Final-Term Examination: 150 Semester Work: 25 Total: 200
8. List of Textbooks and References:	----------
a) Course Notes	Lecturer private notes
b) Required Books (Textbooks)	1. **Quantum Mechanics in Hilbert Space: Second Edition** 2. **Quantum Field Theory: A Modern Introduction, 1993-03** 3. **Advanced Quantum Mechanics (Advanced Texts in Physics)** 4. **Quantum Dots: A Doorway to Nanoscale Physics**
c) Recommended Books	1- Feynman Lectures on Physics Volumes 1,2,3 - Feynman, Leighton and Sands
d) Periodicals, web sites,…,etc	http://rugth30.phys.rug.nl/quantummechanics/ http://phys.educ.ksu.edu/ http://plato.stanford.edu/entries/qm/ http://www.chemistry.ohio-state.edu/betha/qm/ http://www-history.mcs.st-and.ac.uk/HistTopics/The_Quantum_age_begins.html http://www.mtnmath.com/faq/meas-qm.html http://www.upscale.utoronto.ca/GeneralInterest/QM.html

Course Instructor: Dr /Aymn el Okapy **Head of Department**

Date: -----/-----/---- **Prof. Dr. El. M. Elmaghrby**