Quality Assurance Project
Damanhour University
Faculty of Science

Course specification

University/Academy: Damanhour
Faculty/Institute: Science
Department: Physics

1. course Data:

<table>
<thead>
<tr>
<th>Course code:</th>
<th>Course title:</th>
<th>Academic year/level:</th>
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<tbody>
<tr>
<td>PHY (310)</td>
<td>Quantum mechanics (1)</td>
<td>2009-2010</td>
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<td></td>
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<td>3\textsuperscript{rd} year (second term)</td>
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<tr>
<th>Specialization:</th>
<th>No. of instructional units:</th>
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<tr>
<td>Special physics</td>
<td>lecture 4hrs/week tutorial 2hrs/week</td>
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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.

C1: Solving some physical problems helping in understanding the course parts.
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<th>d) General skills</th>
<th>C2: Use the physical knowledge to analyze a suitable technique to solve problems.</th>
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<tr>
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<td>D1: <strong>IT skills</strong>: - use the internet/electronic resources to obtain subject specific information, - use a number of computer packages to present information.</td>
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<td>D2: <strong>Working with others</strong>: work with others as a part of a team to collect data and/or to produce reports and presentations.</td>
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<td>D3: <strong>Self-learning</strong>: - study independently, set realistic targets and plan work and time to meet targets within deadlines.</td>
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<td>D4: <strong>Problem solving</strong>: - Regular problem exercises and examples will give students the chance to develop their theoretical understanding and problem.</td>
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<td>D5: <strong>Communication</strong>: Students will have write reports and give oral presentation.</td>
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| 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. Research 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:
- Assessment 1: 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:
- Lecture private notes

### a) Course 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.upscale.utoronto.ca/GeneralInterest/QM.html

**Course Instructor:** Dr /Aymn el Okapy  
**Head of Department:** Prof. Dr. El. M. Elmaghrby