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>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 453</td>
<td>Bio physics and radiation</td>
<td>2010/2011 4th year (first term)</td>
</tr>
</tbody>
</table>

Specialization: Special zoology

No. of instructional units:
- lecture: 2hrs/ week
- practical: 3hrs/ week

2. course Aim

- The course introduces the interaction of radiation with matter and biological systems besides the radiation detection and dosimetry.
- The course provides the fundamentals of application of physics in biological systems.

3. Intended learning outcome

a) Knowledge and understanding

A1: Define the interaction of radiation with matter.
A2: Recognize the radiation detection and detectors.
A3: Describe the biophysics- biophysical systems.
A4: Recognize the Biophysics techniques.

b) Intellectual skills

B1: Discuss Radiation detection and detectors.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B2:</td>
<td>Discuss Biological effects of radiation.</td>
</tr>
<tr>
<td>B3:</td>
<td>Show the difference between External and internal hazards of radiation sources.</td>
</tr>
<tr>
<td>B4:</td>
<td>Analyze the applications of Bioelectric potentials.</td>
</tr>
<tr>
<td>B5:</td>
<td>Show the Physical properties of living cells with emphasis on passive electrical properties.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c) Professional skills</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C1:</td>
<td>Dissect storage of radioactive materials and disposal of radioactive wastes.</td>
</tr>
<tr>
<td>C2:</td>
<td>Dissect Biomechanics of living cells, forces, in the body Physics of some parts of human body.</td>
</tr>
<tr>
<td>C3:</td>
<td>Dissect the physical knowledge to analyze a suitable technique to solve problems.</td>
</tr>
<tr>
<td>C4:</td>
<td>Dissect some physical problems helping in understanding the course parts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>d) General skills</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>D1:</td>
<td>Use of technology tools: - use the internet/electronic resources to obtain subject specific information,. - use a number of computer packages to present information.</td>
</tr>
<tr>
<td>D2:</td>
<td>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.</td>
</tr>
<tr>
<td>D3:</td>
<td>Write reports improving Self-learning: - study independently, set realistic targets and plan work and time to met targets within deadlines.</td>
</tr>
<tr>
<td>D4:</td>
<td>Write reports and Problem solving: - Regular problem exercises and example will give students the</td>
</tr>
</tbody>
</table>
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 | - Interaction of radiation with matter
| | The interaction between charged particles
| | Gamma radiation and neutrons with matter
| | - Introduction, Electrode technique.
| | - Methods of radiation
| | - Detection and radiation detectors.
| | - Fundamentals of electrochemistry and Resting potential.
| | - Biological effects of ionizing radiations, genetic and somatic effects.
| | - Units of radiation.
| | Action potential and Surface potentials.
| | - External and internal hazards of radiation- Sources and radiation protection.
| | - Treatment of contaminated persons
| | Radiation contamination.
| | - Storage of radioactive materials.
| | - Physical properties of living cells and Bio mechanics.

| 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,
| 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. Practical Examination  
7-4. 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. practical exam. To access professional and practical skills.  
7.4. written exam. To accesses ability to remember & understand scientific background.  
& 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: 100 |
<table>
<thead>
<tr>
<th>practical examination</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>semester work</td>
<td>10</td>
</tr>
<tr>
<td>total</td>
<td>150</td>
</tr>
</tbody>
</table>

8. List of Textbooks and References:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Course Notes</td>
<td>Lecturer private notes</td>
</tr>
</tbody>
</table>
                       2- Biophysics. An introduction, Rodney Cottenill,  
                        2003, John Wiley& Sons LTD  
                       3- Atoms, Radiation and Radiation protection,  
                        James E.Turner. 1985  
                       4- Interscience publication, John Wiley & Sons,  
                        Inc. |
| c) Recommended Books |       |
| d) Periodicals, web sites,…,etc |       |

Course Instructor: Dr. El maghrby Mohamed El maghrby

Head of Department

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

Prof. Dr. El. M. Elmaghrby