Course specification

University/Academy: Damanhour

Faculty/Institute: Science

Department: Physics

1. course Data:		
Course code: PHY (303)	Course title: Nuclear physics (1)	Academic year/level: 2009-2010 3rd year (first term)
Specialization: Mathematics and physics	No. of instructional units: lecture 2hrs/ week tutorial 1hrs/ week practical 3hrs/ week	

2. course Aim	• The course introduces the principles of nuclear physics by studying the constituents of the nucleus and the natural radioactivity**.**
3. Intended learning outcome	
a) Knowledge and understanding	**A1**: Recognize the early researches for measuring nuclear dimensions, charges and masses. **A2**: Know the constituents of the nucleus. **A3**: Understand the natural radioactivity theory
b) Intellectual skills	B1: Develop a clear understanding of the basic concepts in nuclear physics. B2: Construct a solid foundation for advanced nuclear physics course. B3: Apply the laws governing the radioactivity.

c) Professional skills	C1: Explain the nuclear binding energy. C2: Show the difference between nuclear fission and fusion reactions. C3: Use the physical knowledge to analyze a suitable technique to solve problems. C4 : Use basic laboratory equipment.
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	- Rutherford theory of alpha scattering. - Classical properties of the nuclear radius, charge and mass and how to determine each of them. - The constituents of the nucleus. - Applying the principles of wave mechanics to look for the presence of electrons and protons inside the nucleus. - Discovery of neutrons- quark theory. - The nuclear binding energy, nuclear fission and fusion reactions.

	- The natural radioactivity theory and its laws. - Specific radioactivity and units of radioactivity.
5. Teaching and learning methods	**4.1. Teaching will be by lectures, exercises .** **4.2. All learning outcomes are delivered through lectures.** **4.3.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	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: 100 Practical Examination: 30 Semester Work: 10 Total: 150
8. List of Textbooks and References:	----------
a) Course Notes	Lecturer private notes
b) Required Books (Textbooks)	1- Kaplan, I (1969) Nuclear physics 2nd edition, Adison Wesley publishing company, California U.S.A.

	2- مقدمة فى الفيزياء الذرية والنووية – هنرى سيمات ترجمة د/ مصطفى كامل ود. سيد رمضان هدارة – مكتبة النهضة المصرية- 1967. والطبعة الانجليزية الأصلية لنفس المؤلف. 3- الفيزياء النووية د. محمد شحادة الدغمة ود. على محمد جمعة - اصدار دار العزيز للطباعة والنشر – دبى – الامارات العربية المتحدة - الجزء الأول والثانى 1997.
c) Recommended Books	----------
d) Periodicals, web sites,…,etc	----------

Course Instructor: Dr. Yahia keshk

Head of Department

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

Prof. Dr. El. M. Elmaghrby