Course Specifications

Programme(s) on which the course is given : Physics
Major or Minor element of programmes : minor
Department offering the programme Physics
Department offering the course Physics
Academic year / Level Senior (4)
Date of specification approval 2012

A- Basic Information

Title: Radiation physics Code: 456

Credit Hours: 3 hr Lecture:3h
Tutorial: 00 Practicals:00 Total: 3h

B- Professional Information

1 – Overall Aims of Course

*** To introduce the classification of radiation with concentration on the origin, type and characteristics of ionizing radiations**
*** To provide topics on constituents of atomic nucleus, binding energy, stable and radioactive isotopes, decay modes, energies of emitted radiation and radiation protection**
***To present topics on radiation interaction with matter, calculation of energy loss in medium, methods of radiation detection, radioactivity determination in natural samples and radioactive dating.**
***To study units of exposure, dose and dose equivalent**
*** To study the biological effects of ionizing radiations and radiation hazard to human (including hazard from radon isotopes**
*** To introduce some peaceful applications of nuclear technology including the uses in medicine, agriculture and industry.**
*** To develop problem solving skills covering topics of the course.**

2 – Intended Learning Outcomes of Course (ILOs)

a Knowledge and Understanding:

The student will has ability for

a1- identification of natural and artificial ionizing radiations including cosmic-ray particles.

a2- Brief review on atomic nucleus, nuclear structure, decay modes radiation interaction and detection

a3- use of radiation methods in determination of radioactivity in natural samples, radon measurements in houses, dating and the important needs of nuclear technology in various fields of life.

b Intellectual Skills

The student will be able to:

b1- solve problems covering the materials of the course.

b2- convincing students about the important needs of the peaceful applications of nuclear technology in our life.

c Professional and Practical Skills

c1- To gain detailed information about the need and the hazard of ionizing radiation (either natural or artificial).

c2-To gain experience dealing with methods of radiation detection, radiation-shield build up, dating measurements and radiation dose evaluation.

c3-understanding the different mathematical treatments covered in some parts of the course. Special those related to the calculations the radiation doses to human.

d General and Transferable Skills

d1-improving communication through sheets of problem-solving.

d2-ability of giving 10 minutes presentation on topic

of the course.

3- Contents

Topic	No. of hours	Lecture	Tutorial/Practical
Sources of radiation	**3**	**2**	**T**
Constituents of atomic nucleus, binding energy, decay modes and energy calculation	**6**	**4**	**T**
Radiation iteraction mechanisms, radiation detection and radiation shield build up.	**8**	**6**	**T**
Natural radioactive series, radioactivity in natural samples and dating measurement	**3**	**2**	**T**
Units of radiation dose and biological effects of radiation	**3**	**2**	**T**
Origin of radioactive radon isotopes and methods of measurements	**3**	**2**	**T**
Peaceful uses of nuclear technology	**8**	**6**	**T**

4– Teaching and Learning Methods

4.1-lectures

4.2- disscutions

5- Student Assessment Methods

5.1 midterm written exam to assess understanding about the covered first part of the course
5.2-semester activity. to develop communication skills..
5.3 final written exam to assess the overall gain from the course materials
5.4 homework sheets to assess solving problems skills and time constrain

Assessment Schedule

Assessment 1 sheet exam Week 8&16 (mid &final term).
Assessment 2 oral exams Week every week
Assessment 3 written exam Week 15

Weighting of Assessments

Mid-Term Examination	**20 %**
Final-term Examination	**60 %**
Oral Examination.	**10 %**
Semester Work	**10 %**
Total	**100 %**

6- List of References

6.1- Course Notes
6.2-experimental physics ,department of physics,2005.
6.3- Recommended Books
6.4- Periodicals, Web Sites, … etc
www.sciencedirect.com.
Searching for radiation physics sites
Searching for nuclear physics sites

7- Facilities Required for Teaching and Learning
Overhead projector

Course Coordinator: Prof.Dr.Abdel Azim Hussein
Head of Department: Prof.Dr. Sana Maize

Date: / /