



**A- COURSE TITLE, CODE, ACADEMIC YEAR:**

**RADIATION BIOLOGY & PROTECTION (RAD 222) 1437-1438H**

**B- COURSE INFORMATION:**

Course Code	Course Title	Credit Units			Study Level	Pre-requisites
		Total	Theory	Practical		
RAD-222	Radiation Biology & Protection	3	2	1	4 <sup>th</sup>	RAD-221
Course Coordinator		Extension		Email Address		
Dr. Jumaa Yousif T. Yousif				jtamboul@taibahu.edu.sa		

**C- COURSE DESCRIPTION:**

The course is designed to establish a knowledge base in radiobiological effects that can be revealed in the fields where radiation is passed through and therefore, optimization in radiation protection can be managed properly. It gives a broad overview of the basic elements contained in its contents and therefore, provides a basic knowledge to students of biological interactions of radiation, biophysical events and their sequences of occurrence and radio-sensitivity and response of biological cells to these radiations relating these concepts to radiation protection.

**D- COURSE OBJECTIVES:**

1. Identify Radiation dose units.
2. Differentiate between ionizing and nonionizing and radiation effect on biological tissue
3. Describe molecular composition and radiation-induced chemical reactions and potential biologic damage. .
4. Explain the relation between the pregnancy and medical radiation. .
5. Differentiate between the stochastic (probabilistic) and non-stochastic (deterministic) .
6. Explain the objectives of a radiation protection program. .
7. Identify effective dose limits (EDL) for occupational and non-occupational radiation exposure.
8. Describe the ALARA concept:

**E- THEORY TOPICS:**

N. of Week	Theory Topic	Contact Hours
2	Introduction(Justification, Objectives of a radiation protection program, Sources of radiation and legal and ethical responsibilities	4
2	Units, Detection and Measurement	4
2	Surveys, Regulatory/Advisory Agencies and Regulations	4
1	Personnel Monitoring	2



2	Application (Design, regulation and patient protection)	4
1	Designing radiology department considering radiation protection issue	2
1	Basic biologic interactions of radiation.	2
1	Biophysical events	2
1	Radiation effects	2
2	Radio-sensitivity and response	4

#### F- PRACTICAL SESSIONS:

N. of Week	Practical Session	Contact Hours
2	Introduction(Justification, Objectives of a radiation protection program, Sources of radiation and legal and ethical responsibilities	4
2	Units, Detection and Measurement	4
2	Surveys, Regulatory/Advisory Agencies and Regulations	4
1	Personnel Monitoring	2
2	Application (Design, regulation and patient protection)	4
1	Designing radiology department considering radiation protection issue	2
1	Basic biologic interactions of radiation.	2
1	Biophysical events	2
1	Radiation effects	2
2	Radio-sensitivity and response	4

#### G- ASSESSMENT TASKS:

#	Type of assessment task	Week	Total Grades
1	Assignments ( quizzes, seminar homeworks, ect)	Over the course period	10
2	Written Test (1)	8	20
3	Written Test (2)	13	20
4	Final Exam (Practical)	14	10
5	Final Exam (theoretical )	16	40

#### H- LEARNING RESOURCES:

##### 1- Required textbook:

- Chesney's Forshier S (2008). Essentials of Radiation: Biology and Protection. Albany, NY: Delmar Publishers;. ISBN 0766813304 .



- Statkiewicz-Sherer MA. (2006). Workbook for Radiation Protection in Medical Radiography. th ed. St. Louis, Mo: Mosby;. ISBN-10: 032304476 X. ISBN-13 : 978-0323044769.

2- Essential references:

- Radiation Physics Handbook for Medical Physicists, Ervin E. Podgorska, ISBN3540250417
- Radiologic Science for Technologists. Stewart C. Bushong. David T.Culverwell Publisher

**Notes:**

- Assignments topics and requirements shall be announced by the end of Week-1, the deadline for submission is 12pm Thursday of Week-10 (each semester).
- Assignments and written assessment tasks must be verified against plagiarism, the maximum acceptable percentage is determined by the department (according to each level).
- Continuous assessments may include quizzes, internet searches, home-works, exercises, class activity, scratch cards, presentations, group work, etc.
- Practical exams may contain hands-on experiments, laboratory work, simulations, or demonstrations.
- Written exams will include multiple-choice questions (MCQ), short essay questions, and long essay questions.