



Jordan University of Science and Technology
Faculty of Science & Arts
Physics Department

PHY441 Introduction To Radiobiology

First Semester 2017-2018

Course Catalog

3 Credit Hours. Basic principles of radiation biology: factors that modify radiation response; linear energy transfer; relative biological effectiveness; tissue radiosensitivity; time-dose and fractionation; radiobiological modeling.

Text Book

Title	An Introduction to Radiobiology
Author(s)	1- A.H.W. Nias
Edition	2nd Edition
Short Name	Radiology
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Molecular Biology of the Cell	Molecular Biology of the Cell	2- B. Alberts, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walter	4th Edition	

Instructor

Name	Dr. Mohammad Anwar Alibrahim
Office Location	-
Office Hours	
Email	maalibrahim@just.edu.jo

Class Schedule & Room

Section 1:

Lecture Time: Sun, Tue, Thu : 09:30 - 10:30

Room: U

Prerequisites

Line Number	Course Name	Prerequisite Type
922510	PHY251 Modern Physics	Prerequisite / Study
931010	BIO101 General Biology (1)	Prerequisite / Study

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	The Physics and Chemistry of radiation absorption	From Radiology
Week 2	DNA strand breaks and chromosomal aberrations	From Radiology
Week 3	Cell Survival Curves	From Radiology
Week 4	Radiosensitivity and cell age in the Mitotic Cycle	From Radiology
Week 5	Repair of radiation damage and dose rate effect	From Radiology
Week 6	The Oxygen effect and Reoxygenation and linear energy transfer	From Radiology
Week 7	Acute effects of Total-Body irradiation	From Radiology
Week 8	Radiation carcinogenesis, Hereditary effects of radiation	From Radiology
Week 9	Effects of radiation on the embryo/fetus	From Radiology
Week 9	Doses and risks in diagnostic radiology, interventional radiology and cardiology and nuclear medicine	From Radiology
Week 11	Radiation Protection	From Radiology
Week 12	Cell, tissue, and tumor kinetics	From Molecular Biology of the Cell
Weeks 13, 14	Time, dose and fractionation in radiotherapy	From Molecular Biology of the Cell

Mapping of Course Objectives to Program Student Outcomes¹

Assessment method

To develop the ability of making decisions regarding the relative risks and benefits of radiation use in a variety of applications [1(a), 1(i), 1(j), 1(k)]

Review problems of modern biological physics. [1(a), 1(j), 1(k)]

Fundamental knowledge of biological responses to directly and indirectly ionizing radiations. [1(a), 1(j), 1(k)]	
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Relationship to Program Student Outcomes (Out of 100%)										
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
29.17								12.50	29.17	29.17

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