

TOROS ÜNİVERSİTESİ

Vocational School
Medical Imaging Techniques

Course Information

RADIATION BIOLOGY					
Code	Semester	Theoretical	Practice	National Credit	ECTS Credit
		Hour / Week			
TGT108	Spring	2	0	2	2

Prerequisites and co-requisites	
Language of instruction	Turkish
Type	Required
Level of Course	Associate
Lecturer	Lec. Harika TOPAL ÖNAL
Mode of Delivery	Face to Face
Suggested Subject	
Professional practise (internship)	None
Objectives of the Course	It is aimed to learn the effects of ionizing radiation on biomolecules, cell components, cells, tissues and whole body.
Contents of the Course	Cells and tissues, Cell division kinetics, Ionizing Radiation; Distribution of radiation energy; LET and RBE concepts, Effects of radiation on nucleic acids and proteins, Effects of radiation on subcellular units and cells, Cell division and survival concept; Survival curves and target theories, Cell division stages and change of radiation sensitivity, Repair of radiation damage; Effect of dose rate and oxygen, Radiation effect enhancers and radiation protectors, Radiation sensitivities of tissues and organs, Acute effects of radiation in whole body radiation, Delayed radiation effects, Genetic changes and cancer formation effect.

Learning Outcomes of Course

#	Learning Outcomes
1	Description of ionizing radiation on cellular properties.
2	Has information about the effects of ionizing radiation on body cells.
3	Has knowledge about late and early effects of radiation.
4	To have information about the effects of ionizing radiation on cancer.
5	To have knowledge about the effect of radiation on genetic material and repair of cellular radiation damage.

Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Cells and tissues	Presentation, Discussion, question-answer
2	Cells and tissues	Presentation, Discussion, question-answer
3	Cell division kinetics	Presentation, Discussion, question-answer
4	Ionizing Radiation; Distribution of radiation energy; LET and RBE concepts	Presentation, Discussion, question-answer
5	Radiation effects on nucleic acids and proteins	Presentation, Discussion, question-answer
6	Effects of radiation on subcellular units and cells	Presentation, Discussion, question-answer
7	Midterm	Written Examination
8	Cell division and survival concept; Survival curves and target theories	Presentation, Discussion, question-answer
9	Cell division stages and radiation sensitivity change	Presentation, Discussion, question-answer

10	Repair of radiation damage; Effect of dose rate and oxygen	Presentation, Discussion, question-answer
11	Radiation enhancers and radiation protectors	Presentation, Discussion, question-answer
12	Radiation sensitivities of tissues and organs	Presentation, Discussion, question-answer
13	Acute effects of radiation on whole body radiation	Presentation, Discussion, question-answer
14	Delayed effects of radiation	Presentation, Discussion, question-answer
15	Genetic changes and the effect of cancer formation	Presentation, Discussion, question-answer
16	Final Exam	Written Examination

Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	NİAS, A.H.W., An Introduction to Radiobiology, 2nd Edition, J. Wiley and Sons, New York, 1998. KIEFER, J. Biological Radiation Effects Springer-Verlag, Berlin, Heidelberg, New York 1990. ÖZALPAN, A. Temel Radyobiyojiji, 1. baskı, Haliç Üniversitesi, 2001 PODGORSK E. B., Radiation Oncology Physics: A Handbook for Teachers and Students, International Atomic Energy Agency- Vienna, 2005. KHAN F. M., Physics of Radiation Therapy, Lippincott Williams & Wilkins -Minnesota, 2003.		

Method of Assessment

#	Weight	Work Type	Work Title
1	40%	Mid-Term Exam	Mid-Term Exam
2	60%	Final Exam	Final Exam

Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	Description of ionizing radiation on cellular properties.	2,4	1,2
2	Has information about the effects of ionizing radiation on body cells.	3	1,2
3	Has knowledge about late and early effects of radiation.	8,14	1,2
4	To have information about the effects of ionizing radiation on cancer.	2,4,6	1,2
5	To have knowledge about the effect of radiation on genetic material and repair of cellular radiation damage.	6	1,2

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

Work Load Details

#	Type of Work	Quantity	Time (Hour)	Work Load
1	Course Duration	14	2	28
2	Course Duration Except Class (Preliminary Study, Enhancement)	14	2	28
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	1	1
8	Midterm Exam	1	1	1
9	Quiz	0	0	0
10	Homework	0	0	0

11	Midterm Project	0	0	0
12	Midterm Exercise	0	0	0
13	Final Project	0	0	0
14	Final Exercise	0	0	0
15	Preparation for Final Exam	1	1	1
16	Final Exam	1	1	1
				60