Course Title	Course Code	Number of Study Hours				Year	Level	Prerequisites
		Theo.	Lab.	Credit	ECTS			
Radiation Physics	PHYS651	3	-	3	9	1st/ 2nd	2nd/ 3rd	-

Student's workload			
In-class activities	Contact Hours	Self-learning/study	Hours
Lectures	45	Preparation for classes	90
Laboratory	-	Case studies	-
Exams and quizzes	5	Working on lab experiment	-
Lab demo	-	HW/Assignments	32
		Study for exam	70
Total	50	Total	192
Total Learning Hours = 242		Equivalent ECTS points = Total LH/28 = 9	

BRIEF COURSE DESCRIPTION

- This course is designed to provide an understanding of radiation physics and dosimetry. Knowing the international standard radiation standards, and effective use of radiation doses and materials. Developing scientific research skills in the field of radiation physics.

COURSE OBJECTIVES

The main objectives of this course are focused on the following:

1. Describe the radiation and dosimetry.
2. Outline the international standards.
3. Discuss the proper usage of radioactive doses and materials.
4. Solve problem related to the radiation and dosimetry.
5. Illustrate the important radiation detections and instruments

COURSE CONTENTS

- Naturally Occurring Radiation and Radioactivity : Discovery and Interpretation, Background Radiation, Cosmic Radiation, Cosmogenic Radio nuclides, Naturally Radioactive Series, Singly Occurring, Primordial Radio nuclides, Radio activity Dating, Radon and its Progeny (Radon Subseries, Working, Level for Radon Progeny, Measurements of Radon
- Interaction of radiations with matter: Radiation Dose and Units, Radiation Dose Calculations, Interaction Processes, Interactions of Alpha Particles and Heavy Nuclei, Beta Particle Interactions and Dose, Photon Interactions, Photon Attenuation and Absorption, Energy Transfer and Absorption by Photons, Particle and energy flux and fluence, absorbed dose, Biological effectiveness, weighting factors, Equivalent and effective dose, Primary and secondary dosimeters, Different types of dosimeters, Clinical and calorimetric devices, Radiation survey meter for area monitoring,
- Radiation detection and instrumentation: -Solid state nuclear track detectors, Detectors, Organic& Inorganic scintillators, Semiconductor Detectors Biological effects of radiation, Radiation

ASSESSMENT CRITERIA

- Mid-Term exam and Quizzes: 30 %
- Assignments and classroom activities: 20 %
- Final Exam: 50%

COURSE TEACHING STRATEGIES

- Lectures, Discussion and group activity.

TEXT BOOK

- J. E. Martin, Physics for Radiation Protection, A Handbook. ISBN: 3-527-40611-5 (2006)
- L. Munro, Basic of radiation protection for everyday use – How to achieve ALARA working tips and Guidelines, , 2004.

REFERENCE BOOKS

- G. F. Knoll, Radiation detection and measurement, (John Wiley & sons, New York, 2000).
- K. Thayalan, Basic radiological physics, (Jaypee brothers medical Publishers, New Delhi2003).
- G. C. Lowenthal and P. L. Airey, Practical applications of radioactivity and nuclear radiation sources (Cambridge University Press 2005).
- M. A. S. Sherer, P.J. Visconti, E. R. Ritenour, Radiation Protection in medical radiography, Mosbey, (Elsevier 2006).