UNIVERSITY OF PATRAS
SCHOOL OF HEALTH SCIENCES
DEPARTMENT OF PHARMACY
UNDERGRADUATE STUDIES' COURSES

COURSE DESCRIPTION: **BASIC PRINCIPLES OF NUCLEAR PHARMACY & RADIOPHARMACY**

COURSE CODE: **PHA-E12-NEW**

BASIC PRINCIPLES OF NUCLEAR PHARMACY AND RADIOPHARMACY
COURSE DESCRIPTION

1. GENERAL

SCHOOL	HEALTH SCIENCES		
SEPARTMENT	PHARMACY		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	**PHA-E12-NEW**	**SEMESTER OF STUDIES**	**9th**
COURSE TITLE	BASIC PRINCIPLES OF NUCLEAR PHARMACY AND RADIOPHARMACY		

INDEPENDENT TEACHING ACTIVITIES	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
Lectures	3	3
Tutorials	1	

COURSE TYPE	Scientific Field course
PREREQUISITE COURSES:	-
TEACHING AND ASSESSMENT LANGUAGE:	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes [Instructed/Guided self study in english for Erasmus+ Students]
COURSE WEBPAGE (URL)	http://www.pharmacy.upatras.gr/images/DS/PHA-E12-EN.pdf

2. LEARNING OUTCOMES

Learning Outcomes

The Learning Outcomes of this course corresponding to Level 7, comprise the following:

- Highly specialized knowledge, some of it cutting-edge in the fields of Nuclear Pharmacy and Radiopharmacy, as a base for innovative thinking and research
- Critical understanding of the knowledge status in these fields and their interrelationship with other fields
- Specialized skills for problem-solving, necessary in research and/or in innovation, in order to generate novel knowledge and processes
- Management and evolution in changing, unpredictable and complex work environments, requiring novel strategic approaches
- Responsibility for contributing to the enrichment of professional knowledge and practice in the fields

Specifically, the lessons aim to understanding a) the basic characteristics of radionuclides and the mechanisms of radioactive decay, b) the basic characteristics of radiation α, β and γ, their interaction with matter and the biological risk from external and internal exposure in radiation and c) in the radiation measurement, the principles and characteristics of radiation counters and the methods of radiation measurements in biological samples (dry and wet techniques).

In the second part the physical, chemical and biological properties of basic radioisotopes/radionucleotides which are used in nuclear medicine are analysed. Methods of preparation and Clinical applications as therapeutics and/or diagnostics.

In the third part ways to produce radioisotopes in large and small scale are presented, as well as methods for protection and monitoring of exposure to radiation.
General Abilities
1. Self-study 2. Work in inter σε interdisciplinary environment 3. Adapt to new situations 4. Search, analysis and synthesis of information

3. **COURSE CONTENT**

1. Structure of matter
2. Radioactive decay (classification of radionuclides, mechanisms of decay, kinetic, half-time)
3. Basic characteristics of radiations (α, β, γ, Xray) and their interaction with matter
4. Radiation measurement
5. Quality control
6. Characteristics of basic radionucleotides used in medicine [Tc, J, Ga, In, Xe, Kr, Tl, F, Co, Hg, Cr, Sr, Fe, Se, Yb, Ir, Au, P, Y]
7. In vitro radioanalytical methods
8. Exposure (ways) and biological results of Radiation
9. Fundamentals of Protection from Radiation
10. Sources and Production of radioisotopes
11. Nuclear Reactor, Cyclotron, and Radioisotope Generators

4. TEACHING AND LEARNING METHODS - ASSESSMENT

Teaching method	In the class	
Use of information and communication technologies	Support of learning process through the online platform e-class	
Teaching organization	***Teaching Method***	***Semester Workload***
	Lectures	39
	Tutorial	13
	Autonomous study	23
	Total number of hours for the Course	
	(25 hours of work-load per ECTS credit)	**75**
STUDENT ASSESSMENT	Final written examination including: • Questions requiring short answers/comments • Judgment questions	

5. RECOMMENDED LITERATURE

1. Chiotellis Efstratios, Radiopharmaceutical Chemistry, Publisher SIMONI Olga, 75th edition, 2004 (in Greek)
2. Papastefanou Konstantinos, Radiation Physics and Applications of Radioisotopes, Publisher ZITI Pelagia & Co, 4th edition, 2014 (in Greek)
3. Gopal B. Saha, Fundamentals of Nuclear Pharmacy, Springer, 5th edition, 2003