City University of Hong Kong
Course Syllabus

offered by Department of Physics
with effect from Semester A 2024/25

Part I Course Overview

Course Title:	**Advanced Nuclear Medicine Physics**
Course Code:	**PHY6523**
Course Duration:	**One semester**
Credit Units:	**3**
Level:	**P6**
Medium of Instruction:	**English**
Medium of Assessment:	**English**
Prerequisites: *(Course Code and Title)*	**NA**
Precursors: *(Course Code and Title)*	**NA**
Equivalent Courses: *(Course Code and Title)*	**NA**
Exclusive Courses: *(Course Code and Title)*	**PHY8523 Advanced Nuclear Medicine Physics**

Part II Course Details

1. Abstract

This course will advance understanding of nuclear medicine for imaging and radiotherapy. Topics covered will include: radionuclide production, transfer, storage, and handling; detection methods; and applications.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Radiation physics related to nuclear medicine. Emphasis will be on radioactive decay sources and interactions interaction of high energy photons and particles with heavy metals and body tissues.	50		✔	
2.	Nuclear medicine imaging: principles and applications.	30		✔	
3.	Nuclear medicine therapy: principles and applications.	20		✔	
		100%			

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Learning and Teaching Activities (LTAs)

(LTAs designed to facilitate students' achievement of the CILOs.)

LTA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4			
Lecture	Presentation of course material	13	8	5				2
Tutorial	Review of course material	7	4	2				1

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting	Remarks
	1	2	3	4				
Continuous Assessment: _30_%								
Monthly assignments	15	9	6				30	
Final examination	35	21	14				70	
Examination: _70_% (duration: 2 hours)								
							100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Exam	Understanding of fundamental concepts and applications of radiation physics related to nuclear medicine, imaging and radiotherapy.	High	Significant	Moderate	Basic	Not even marginal level
2. Assignments	Explain key concepts of nuclear medicine for imaging and radiotherapy	High	Significant	Moderate	Basic	Not even marginal level

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Exam	Understanding of fundamental concepts and applications of radiation physics related to nuclear medicine, imaging and radiotherapy.	High	Significant	Moderate	Not even marginal level
2. Assignments	Explain key concepts of nuclear medicine for imaging and radiotherapy	High	Significant	Moderate	Not even marginal level

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

Radiation physics:

- Radionuclide production, transfer, storage, handling, and disposal
- Gamma ray scattering and absorption
- High-energy particle scattering and absorption
- Dosimetry (calculations and measurements)

Imaging applications:

- Uptake measurement
- Scintigraphy
- Single-photon emission computed tomography (SPECT)
- Positron emission tomography (PET)

Therapeutic applications:

- Treating thyroid and blood disorders
- Other disorders

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	
2.	
3.	
…	

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Radiation Physics for Medical Physicists
2.	
3.	
…	