

**City University of Hong Kong
Course Syllabus**

**offered by Department of Physics
with effect from Semester A 2022/23**

Part I Course Overview

Course Title: **Advanced Nuclear Medicine Physics**

Course Code: **PHY8523**

Course Duration: **One semester**

Credit Units: **3**

Level: **R8**

**Medium of
Instruction:** **English**

**Medium of
Assessment:** **English**

Prerequisites: **NA**
(Course Code and Title)

Precursors: **NA**
(Course Code and Title)

Equivalent Courses: **NA**
(Course Code and Title)

Exclusive Courses: **PHY6523 Advanced Nuclear Medicine Physics**
(Course Code and Title)

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)

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 self-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. Teaching and Learning Activities (TLAs)

TLA	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)

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

Applicable to students admitted in Semester A 2022/23 and thereafter

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

Applicable to students admitted before Semester A 2022/23

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

Part III Other Information

1. Keyword Syllabus

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

1.	
2.	
3.	
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2.2 Additional Readings

1.	Radiation Physics for Medical Physicists
2.	
3.	
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