

Postgraduate Certificate in Radiation Physics and Radiation Safety – SC537 (Under Review)

1. Context and Objectives

The Department of Physics has partnered with the Radiation Protection Authority of Mauritius to develop this Postgraduate Certificate in Radiation Physics and Radiation Safety course. It is designed to provide the technical training and practical information needed to prepare a person to be an effective radiation safety officer. The course will also be useful as general introductory training for anyone who works with radioactive materials. It provides the fundamentals of regulatory requirements, policies and implementation practices for working with and supervising those who work with radioactive materials and radiation-producing machines.

This Postgraduate Certificate programme is structured into lectures and practical sessions, both of them focusing on practical issues related to radiation safety practices. The course includes the required training for the transportation and disposal of radioactive materials and contains several practical hands-on sessions in laboratories on radiation measurements and instrumentation.

In this Postgraduate Certificate in Radiation Physics and Radiation Safety course, students will explore the characteristics of ionizing radiation, develop an understanding of the units of radiation dose and quantities, gain hands-on experience using radiation detection instrumentation, and learn about the biological effects resulting from exposure to radiation.

2. Learning Outcomes

After successful completion of this programme, graduates should be able to:

- Explain the basic principles that underpin radiation physics, e.g. atomic structure, nuclear science, radioactivity, X-rays, etc;
- Appraise radioactivity and types of radiation, their properties, units of measure, dosimetry measurement concepts and methods;
- Undertake complex calculations involving processes in radioactive decay and radiation interaction with matter pertaining to the production and use of ionising radiation;
- Describe the operation of various radiation detectors and radiation dosimeters;
- Assess the appropriateness of the use of differing radiation detector types for specific radiation measurement tasks;
- Explain the principles and practice of radiation protection, dose limits, screening and protection mechanisms with regard to both risks and benefits;
- Describe standard codes of practice recommended by national and international radiation councils/authorities, and define quality assurance and quality control in the context of radiation protection/safety and the legal requirements/frameworks;
- Recommend and implement procedures to safeguard people from radiation hazards.

3. Teaching and Learning Methods

Modules shall be taught over 10 weeks in accordance with the Learner-Centred Credit System (LCCS) at the University. Each module shall include at least 3 hours of contact per week, involve 6 hours of self-study per week and up to 9 hours of other learning activities per week for each semester. The contact hours shall include class hours, tutorials and practical sessions.

Details of the teaching and learning methods:

- Lectures including face-to-face and/or online teaching
- Tutorial classes
- Practical work including lab demonstrations and hands-on practical sessions
- Self-learning including case studies
- Other learning activities such as pre-lab works, assignments, class tests, site visits/trips, seminars/workshops and revision.

4. Entry Requirements

4.1 General Requirements:

Successful completion of an undergraduate degree with

- at least a Second Class or CPA $\geq 50\%$, whichever is applicable or
- a GPA not less than 2.5 out of 4 or equivalent, from a recognised higher education institution.

OR alternative qualifications acceptable to the University of Mauritius.

4.2 Programme (Specific) Requirements:

- Undergraduate degree in a science subject (for example Physics/Chemistry/Biology/Biosciences/Health Sciences/Medical Sciences) or equivalent qualifications acceptable to the University of Mauritius.
- A-Level in Physics and Mathematics or alternative subjects acceptable to the University of Mauritius. Students not holding A-Level in Physics and/or Mathematics will be required to register and complete successfully the foundation module PHYMA 1100.

4.3 Special Cases:

The following may be deemed to have satisfied the General and Programme requirements for admission:

- (i) Applicants who do not satisfy any of the requirements as per sections 4.1 and 4.2 above but who submit satisfactory evidence of having passed examinations which are deemed by the Senate to be equivalent to any of those listed.
- (ii) Applicants who do not satisfy any of the requirements as per Sections 4.1 and 4.2 above but who in the opinion of Senate submit satisfactory evidence of the capacity and attainments requisite to enable them to pursue the programme proposed.
- (iii) Applicants who hold a full practising professional qualification obtained by examination.

5. Programme Duration

The Programme is offered on a full-time (F/T) basis and/or on a part-time (P/T) basis as per the table below:

	Normal Duration	Maximum Duration
Full-Time (F/T)	1 semester	2 semesters (1 Year)
Part-Time (P/T)	2 semesters (1 Year)	3 semesters (1½ Years)

6. Minimum LCCS Credits Required

A minimum of 24 LCCS credits will be required for the award of the postgraduate certificate, with details as follows:

	Semester 1	Semester 2
Full-Time (F/T)	24 LCCS credits	-
Part-Time (P/T)	12 LCCS credits	12 LCCS credits

7. Assessment and Deadlines

Each module will carry 100 marks and will be assessed as follows (unless otherwise specified):

Assessment will be based on a written examination of 2 to 3-hour duration and continuous assessment for each module. Continuous assessment ranges from 40% to 50% of the overall total marks for a module. Continuous assessment may be based on laboratory work and/or assignments and/or seminars and shall include at least one (1) written class test per module.

A minimum overall total of 40% is required to pass a module.

Written Examinations will be held at the end of the semester in which the module is offered.

8. List of Modules

Module Code	Module Name	Learning Hours				LCCS Credits
		Lectures/ Tutorials	Practicals	Self- Study	Other Activities	
PHYMA 1100*	Foundation Module in Physics and Mathematics	30	0	60	90	-
PHYRAD 6001(1)	Radiation Physics	30	0	60	90	6
PHYRAD 6002(1)	Radiation Detection and Measurements	20	20	60	80	6
PHYRAD 6003(1)	Radiation Protection	20	20	60	80	6
PHYRAD 6004(1)	Radiation Protection Legislation and Regulations	30	0	60	90	6

9. Programme Plan

Full-Time (one semester)

Module Code	Module Name	Learning Hours				LCCS Credits
		Lectures/Tutorials	Practicals	Self-Study	Other Activities	
PHYMA 1100*	Foundation Module in Physics and Mathematics	30	0	60	90	-
PHYRAD 6001(1)	Radiation Physics	30	0	60	90	6
PHYRAD 6002(1)	Radiation Detection and Measurements	20	20	60	80	6
PHYRAD 6003(1)	Radiation Protection	20	20	60	80	6
PHYRAD 6004(1)	Radiation Protection Legislation and Regulations	30	0	60	90	6
Total:						24

Part-Time (two semesters)

Semester 1

Module Code	Module Name	Learning Hours				LCCS Credits
		Lectures/Tutorials	Practicals	Self-Study	Other Activities	
PHYMA 1100*	Foundation Module in Physics and Mathematics	30	0	60	90	-
PHYRAD 6001(1)	Radiation Physics	30	0	60	90	6
PHYRAD 6002(1)	Radiation Detection and Measurements	20	20	60	80	6
Total:						12

Semester 2

Module Code	Module Name	Learning Hours				LCCS Credits
		Lectures/Tutorials	Practicals	Self-Study	Other Activities	
PHYRAD 6003(1)	Radiation Protection	20	20	60	80	6
PHYRAD 6004(1)	Radiation Protection Legislation and Regulations	30	0	60	90	6
Total:						12

*PHYMA 1100 is compulsory for students not holding an A-level in Physics and/or Mathematics. This Foundation module PHYMA 1100 carries no credits and will be examined by continuous assessment, including a class test, and a 2-hour written examination at the end of the semester. Successful completion of this module will result in a Grade S (Satisfactory).