Module Specification

Nuclear Medicine

Version: 2026-27, v1.0, 27 Feb 2025

Contents

Part 1: Information

Module title: Nuclear Medicine

Module code: USSYQV-60-3

Level: Level 6

For implementation from: 2026-27

UWE credit rating: 60

ECTS credit rating: 30

College: College of Health, Science & Society

School: CHSS School of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: Applied Medical Physics 2026-27

Excluded combinations: None

Co-requisites: None

Continuing professional development: Yes

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module covers radiopharmacy, instrumentation in radionuclide assay and imaging and clinical applications of nuclear medicine, including Positron Emission Tomography (PET).

Pre-requisites: Students must have passed USSYQL-60-2 Applied Medical Physics before starting this module.

Features: This module is available as CPD.

Educational aims: The aims of this module are to ensure that the student has an understanding of the principles of radiopharmacy, radionuclide assay, and medical imaging technologies in nuclear medicine and can apply these principles to clinical applications in diagnosis and therapy.

Outline syllabus: The indicative syllabus of the module is as follows:

Radiopharmacy:
Principles of radionuclide production:
Principles of radiochemistry
Principles of radiopharmaceutical manufacture
Quality control of radiopharmaceuticals
Transport of radiopharmaceuticals by road.

Assay of Radionuclides:
Counting statistics
Principles and applications of the assay of radionuclides
Commonly used instrumentation for the assay of radionuclides

Imaging Systems used in Nuclear Medicine:
Principles of operation, performance characteristics and QC procedures for gamma camera imaging systems in nuclear medicine
Principles of operation, performance characteristics and QC procedures for imaging systems in positron emission tomography (PET).
Image quality in nuclear medicine
Review of tomographic reconstruction techniques as applied to nuclear medicine.

Clinical Applications of Nuclear Medicine in Diagnosis and Therapy (molecular radiotherapy):
Principles, practical implementation and clinical applications of commonly performed gamma camera diagnostic imaging investigations.
Principles, practical implementation and clinical applications of commonly performed PET/ PET-CT diagnostic imaging investigations
Principles and practical implementation of therapeutic applications of radionuclides in

nuclear medicine (molecular radiotherapy).

Radiation dosimetry and radiation protection in nuclear medicine:
Dosimetry of unsealed and sealed radionuclide sources
Review of specific radiation protection and risk considerations for nuclear medicine patients with reference to the relevant legislative framework
Review of radiobiological effects of ionising radiation.

Part 3: Teaching and learning methods

Teaching and learning methods: This module will be delivered via a blended approach of on-campus practical and skills development activities held during block release weeks, and online lectures, seminars and tutorials, held throughout the academic year. This will be backed up by the apprentices carrying out guided self-study.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Describe and explain the principles and practice of radionuclide production and manufacture of radiopharmaceuticals including considerations of quality control.

MO2 Describe and explain the principles of operation and applications of a range of equipment used for the detection and assay of radionuclides.

MO3 Describe and critically evaluate imaging systems used in the acquisition and processing of nuclear medicine images, including principles of operation, performance and quality control.

MO4 Describe and critically evaluate the application of nuclear medicine in diagnosis and therapy for a range of body systems.

MO5 Explain radiation dosimetry and safety as applicable to nuclear medicine practice.

Hours to be allocated: 600

Contact hours:

Independent study/self-guided study = 200 hours

Face-to-face learning = 80 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ussyqv-60-3.html

Part 4: Assessment

Assessment strategy: Assessment 1: Portfolio (1500 words per piece of graded evidence).

This assessment comprises a portfolio of evidence collated from the workplace. Two components will be assessed. These will be a case-based discussion formed as a written clinical review of a specified application of nuclear medicine and a write up of performance tests on the radioisotope calibrator carried out personally in the workplace. The remaining work must be passed, but will not be graded.

This assessment links directly to competencies in the portfolio. The two pieces of work will assess scientific writing and literature review skills and experimental report writing skills. The requirement for the apprentice to carry out their own experimental work will minimise the opportunity for plagiarism.

Assessment 2: Exam (2 hours)
This examination will provide apprentices with an opportunity to demonstrate their knowledge on a broad range of topics in nuclear medicine. This will be a mix of short and longer answer questions for apprentices to complete.

Formative assessment will be carried out using online quizzes, example sheets,

online resources etc. Use will also be made of peer based discussions and feedback.

Assessment tasks:

Portfolio (First Sit)
Description: Portfolio of evidence collated from the workplace.
Weighting: 70 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO4

Examination (First Sit)
Description: Exam (2 hours)
Weighting: 30 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Portfolio (Resit)
Description: Portfolio of evidence collated from the workplace.
Weighting: 70 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO4

Examination (Resit)
Description: Exam (2 hours)
Weighting: 30 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Healthcare Science (Nuclear Medicine) {Apprenticeship-UWE} [Frenchay] BSc (Hons) 2024-25