



University of the
West of England

POSTGRADUATE MODULAR PROGRAMME

MSc Nuclear Medicine

PROGRAMME SPECIFICATION

Original approval 1996 (MSc Nuclear Medicine Technology)

University of the West of England



Programme Specification

Section 1:	Version 7
Awarding institution/body	University of the West of England
Teaching institution	University of the West of England
Faculty responsible for programme	Faculty of Health and Life Sciences School of Health and Social Care
Programme accredited by	
Highest award title	MSc Nuclear Medicine
Default award title	
Interim award title	PG Diploma Nuclear Medicine PG Cert Nuclear Medicine
Modular Scheme title (if different)	
UCAS code (or other coding system if relevant)	
Relevant QAA subject benchmarking group(s)	
On-going/valid until* (*delete as appropriate/insert end date)	
Valid from (insert date if appropriate)	01/09/2010

Authorised by...

Date:...

Version Code

For coding purposes, a numerical sequence (1, 2, 3 etc.) should be used for successive programme specifications where 2 replaces 1, and where there are no concurrent specifications. A sequential decimal numbering (1.1; 1.2, 2.1; 2.2 etc) should be used where there are different and concurrent programme specifications

Section 2: Educational aims of the programme

- Acquire core knowledge and skills based on clinical practice together with advanced education in nuclear medicine. Thus enabling the application of knowledge and skills in a safe, reflective and critical manner, as a competent autonomous practitioner
- Develop a critical understanding of the educational and research foundations to promote the critical evaluation of working practice in the clinical field
- Enhance cognitive abilities commensurate with an autonomous practitioner and the application of knowledge and skills
- Develop the requisite skills and an in-depth knowledge to enable the student to contribute to the existing body of knowledge in nuclear medicine through research and publication.

Section 3: Learning outcomes of the programme

The award route provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas: ...

A Knowledge and understanding

Learning outcomes

A Knowledge and understanding

Graduates from this programme will have an in-depth knowledge and broad-based understanding of:

1. Relevant theoretical and practical knowledge to the understanding of anatomical structures and systems demonstrated in Nuclear Medicine and describe the physiological pathways used to image organs or systems
2. Systematic understanding the appearances and impact of changes in metabolism and/or clearance pattern of the imaging agent, for a wide range of pathologies
3. Scientific principles of nuclear medicine & Nuclear medicine equipment and devices to ensure optimal imaging of patients
4. A comprehensive understanding of imaging protocols / techniques which may be utilised in routine clinical practice and continue to develop knowledge and understanding and other appropriate skills
5. Develop and evaluate new techniques to the Nuclear Medicine department within a multidisciplinary team
6. Radiation protection related to safe working practice and radiation dosimetry
7. Detecting and describing normal and common pathological conditions encountered in radionuclide imaging
8. The implications of research based evidence to inform and guide practice and a conceptual understanding that enables students to critically evaluate current research / evaluate methodologies where appropriate

Teaching, Learning and Assessment Strategies

Teaching/learning methods and strategies:

The competent practitioner will emerge through the application of theory [1-8] to practice in the clinical setting by having a reflective and critical manner to their work. Competency is underpinned by an in depth knowledge and understanding of the science of nuclear medicine [3, 6, 8] and its application in a contemporary clinical situation.

The student is encouraged to undertake independent reading both to supplement and consolidate what is being taught / learnt and to broaden their individual knowledge and understanding of the subject areas.

Knowledge and understanding strategies include expert led key lectures from staff within the Faculty and experienced clinical practitioners, tutorials, problem based learning, seminars, directed reading and clinical practice. Student led seminars and peer support will further promote knowledge and understanding [4, 5, 7, 8] via the sharing of experience and ideas in a multi-professional environment.

The student will demonstrate originality in the application of knowledge and understanding and encompass new learning paradigms into routine clinical practice. This will also provide a platform for further professional development of the practitioner.

Assessment:

Testing of the knowledge base and understanding in written assignments and experiments [1, 3, 4, 6, 8] part seen written examinations [3, 5] and presentations [1, 2, 5] In addition, practice based assessments and Objective Structured Clinical Examinations (OSCE) will provide evidence of the application of these skills to clinical practice. [1, 2, 3, 4, 6, 7, 8]

B Intellectual Skills

B Intellectual Skills

Graduates from this programme should demonstrate in breadth and depth:

1. Analytical skills which relate to a range of clinical competencies and professional practice
2. Critically evaluate contemporary research in nuclear medicine and other imaging modalities/practice in order to inform practice and consider new approaches where appropriate. Discuss such findings within suitable environments
3. Critical awareness of current issues / problems related to the profession
4. Evaluation skills related to the integration of ethical, legal and management issues within effective rational decision making and to recognise the professional barriers which may cause inhibition of this process
5. Synthesis of appropriate clinical information and critically evaluate images and data in respect of data collection, manipulation and presentation.

Teaching/learning methods and strategies

Student led seminars, group work and the sharing of ideas through experience of clinical practice [1 -6]. Suitably experienced appraisers also facilitate clinical learning, via the mentorship of students and undertaking clinical assessments.

Students will experience different learning paradigms, which will draw upon the experience of themselves, as practitioners and from experts within the field of nuclear medicine. The sharing of experience is actively encouraged and individual creativity and critical thinking is encouraged.

Assessment

Assessments of nuclear medicine are an integral part of the clinical practice module. A full range of assessment methods are employed. The student's ability to demonstrate skills 1, 3, 4 and 5 are assessed through clinical assessments, portfolios and e-OSCEs and 2, 3, 4 via written assignments / course work.

C Subject, Professional and Practical Skills

C Subject/Professional/Practical Skills Teaching/learning methods and strategies

The student will be able to:

1. Competently undertake a range of imaging procedures skilfully, safely and to a high standard and practice autonomously
2. Justify the contribution and the role of nuclear medicine to the overall management of patients and act within an autonomous role
3. Critically reflect upon the multi disciplinary professional community and how this may impact upon ones own practice and the practice of others
4. Relate to professional issues and encompass them within routine clinical practice & exhibit an understanding and insight of the role development for nuclear medicine practitioners / advanced practice
5. Demonstrate an awareness of developing imaging techniques / technologies, which may not necessarily be performed within the students own department
6. Make evaluative judgements on the outcomes of nuclear medicine procedures and practices and report the findings accordingly
7. Recognise and take appropriate action in situations where the limits of their skill or knowledge are being approached
8. Detect and describe normal pattern of distribution of commonly used radionuclides and radiopharmaceuticals and any common artefacts imaged enabling appropriate further imaging where appropriate
9. Develop the clinical skills of the practitioner enabling them to describe, discuss and evaluate radionuclide imaging procedures

Skills 1 -9 are developed and learnt within clinical practice, key lectures and peer learning mechanism (e.g. group discussions, case study presentations). Autonomous practitioners are expected to manage their own clinical learning using action plans, reflective practice, clinical portfolios and formative clinical assessments.

Students will be engaged in the critical thinking, analysis and evaluation of all aspects of nuclear medicine practice. This will provide the student the opportunity to enhance their clinical skills

Assessment

Staged clinical assessments will be undertaken and evaluated during year one to determine the proficiency of the student in the practice of nuclear medicine [1]. The performance of image acquisition, manipulation and presentation of the nuclear medicine data will be assessed to determine if the student has achieved the desired level of proficiency. The performance of the study will be supervised by an appropriately skilled practitioner (usually a mentor) in nuclear medicine. The supervisor will assess the safe practice of the study and the correct application of an appropriate imaging protocol. The student will be able to integrate the theory and practice in all areas. A variety of ways will be used to assess the proficiency of the student. A clinical portfolio consisting of a work journal, clinical assessments and case studies will chronicle the student's proficiency in the clinical situation and will contribute to their final mark [4, 7, 9]. The student will also be expected to undertake a formal presentation (summative assessment) and discuss case studies during the programme delivery.

Skills 1, 6, 8, 9 will be assessed using an OSCE environment which will provide an environment to measure interpretation skills, problem solving skills and pattern distribution of radioisotope tracer.

D Transferable Skills and other attributes

D Transferable skills and other attributes Teaching/learning methods and strategies

The student will be able to:

1. Communicate effectively, both within the realms of the nuclear medicine department and as part of a multi-disciplinary team
2. Demonstrate problem solving abilities and deal with complex issues in a systematic and creative manner
3. Exhibit autonomous practice within the field of nuclear medicine and actively develop new skills, which reflect the clinical service offered to patients
4. Demonstrate an ability to adapt effectively to new or unusual situations
5. Make decisions in complex and possibly unpredictable situations & reflect and evaluate personal academic, professional and clinical performance
6. Use Information Technology competently and effectively to manipulate digital information in the most efficient and effective manner
7. Embed new learning paradigms and an independent learning ability which will ensure the practitioner is consummate with future professional development
8. Develop mentor / supervisory skills which could be utilised within the clinical department in the form of student training / practitioner supervision

Use of peer group discussion as a mechanism to share and challenge ideas. In addition, the support of clinical mentors and active involvement with other health care professionals will ensure the student communicates effectively [1] and demonstrates problem solving abilities [2], especially when undertaking challenging procedures [4].

Student led seminars to facilitate their own management and learning in appropriate forums, which may be synchronous or asynchronous in nature [1, 6, 7]. The use of digital imaging workstations and the Faculty's virtual learning environment will also facilitate the students learning [3, 6, 7], whereby access to processing and digital manipulation environments will form part of the learning paradigms of the programme.

Formative use of clinical assessment documentation and learning contracts to facilitate reflection of clinical practice [1, 3, 4, 5]. The majority of transferable skills will be acclaimed through engagement in clinical practice and aforementioned learning strategies. The use of electronic presentations, electronic assessments (e-OSCE), research literature database searching and assignment writing will also enhance the acquisition of skills 6 and 7

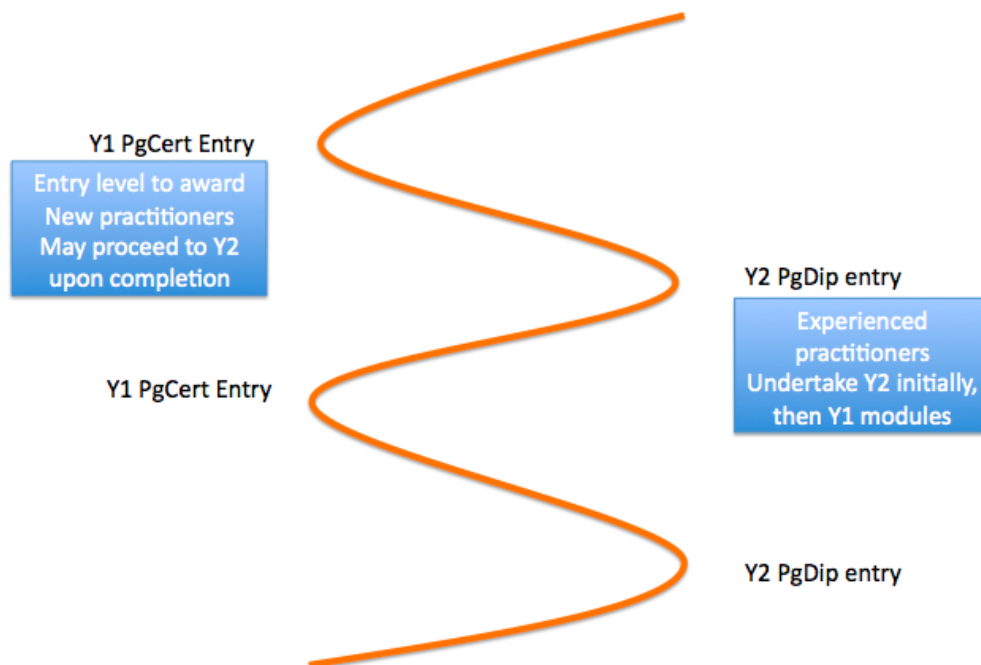
Assessment

Clinical portfolio, clinical case studies and formative clinical appraisals [1, 2, 3, 4, 5] – test competency, knowledge, understanding, reflective practice and the effective use of resources.

The use of e-OSCE assessments will measure skills 2 & 6 and the non-medical reporting of nuclear medicine images. Written assignments will assess skills 1, 2, 4, 6 and clinical experience will further develop skills 1, 5, 7, 8.

Section 4: Programme structure

There is a traditional entry of students every two years, due to the relatively small nuclear medicine training pool within the United Kingdom. However, practitioners with a minimum of eighteen modules clinical nuclear medicine experience may be eligible to initially enrol on the second year of the programme and subsequently complete the first year of the programme in order to claim a postgraduate diploma award:



The development of a modular approach enables the student to select the modules most appropriate to their needs and their work commitments. The modules are designed to be accessible to Radiographers, Nuclear Medicine Technologists, other health care professionals and clinical engineers. Normally students may exit the Programme with a postgraduate certificate, diploma or MSc in Nuclear Medicine, following achievement of appropriate modules. Students who enrol on the second year of the programme and do not proceed to complete the first year of the programme (Pg Cert modules) may AL their acquired credits into the Specialist Practice programme / SHELL framework.

Following achievement of appropriate modules students may exit the Programme with a postgraduate certificate, diploma or MSc in Nuclear Medicine

Pattern of attendance: Students undertaking this programme should ideally be working within the nuclear medicine department for at least half of their clinical time, for the duration of the professional practice module. It is crucial that students undertaking this module gain the necessary clinical experience in order to meet the learning outcomes of the module.

Year 1	<p>Compulsory modules</p> <ul style="list-style-type: none"> • UZYRKU-20-M Science and Instrumentation of Nuclear medicine • UZYRSB-40-M Clinical Skills in Nuclear Medicine 	<p>Optional modules</p> <p>Following discussion with the Programme Leader students will have the option of a modules choice from the generic pool of M level modules.</p> <p>Suitable options may include:</p> <ul style="list-style-type: none"> • UZYSDR-20-M Science and Instrumentation of Computed Tomography • UZYSDQ-20-M Cross Sectional Anatomy and Related Pathology • UZYSDL-20-M Clinical Protocols and Fundamental Applications of Computed Tomography 	<p>Interim Award:</p> <p>PG Cert Nuclear Medicine</p> <p>60 credits at Level M consisting of : UZYRKU-20-M and UZYRSB-40-M</p>
Year 2	<p>Compulsory modules</p> <ul style="list-style-type: none"> • UZWRGQ-20-M Health and Social Care Research: Methods and Methodology • UZYRKS-20-M Enhancing Nuclear Medicine Practice <p>Core modules PLUS 20 credits from the following</p> <ul style="list-style-type: none"> • UZYRKW-20-M Reporting Skills in Nuclear Medicine • UZVS6C-20-M Informatics for Health and Social Care • UZYSAM-20-M Hybrid Imaging in Nuclear Medicine 	<p>Suitable options may include:</p> <ul style="list-style-type: none"> • UZYSDR-20-M Science and Instrumentation of Computed Tomography • UZYSDQ-20-M Cross Sectional Anatomy and Related Pathology • UZYSDL-20-M Clinical Protocols and Fundamental Applications of Computed Tomography 	<p>Interim Awards</p> <p>PG Diploma Nuclear Medicine</p> <p>120 credits at level M consisting of: UZYRKU-20-M UZYRSB-40-M UZWRGQ-20-M UZYRKS-20-M plus 20 credits from the optional choice of modules available to the programme and following discussion with the programme leader</p>
Year 3	<p>Compulsory modules</p> <ul style="list-style-type: none"> • UZWS4W-60-M Dissertation <p>OR</p> <ul style="list-style-type: none"> • UZWS4V-40-M Dissertation <p>PLUS 20 credits from the level M optional modules listed in the optional module column or either UZYRKW-20-M or UZYSAM-20-M depending on which module was completed at PG Dip level</p>		<p>Award:</p> <p>MSc Nuclear Medicine</p> <p>180 credits at level M</p> <p>Pre-requisite requirement:</p> <p>An honours degree or overseas equivalent, relevant health qualification registerable in the United Kingdom.</p> <p>Professional experience in the field of Nuclear Medicine</p>

Section 5: Entry requirements

Applicants will normally have the following qualifications:-

- an Honours degree of a United Kingdom Higher Education Institution or overseas equivalent
- relevant health qualification registerable in the United Kingdom
- professional experience in the field of Nuclear medicine – eighteen months experience is required if initially enrolling on year two of the programmes

Applicants to the programme may be from a varying background both in terms of education and experience. Applicants will be assessed on an individual basis taking work experience and academic study/qualifications into consideration. Experienced practitioners with relevant qualifications such as the Diploma in Radionuclide imaging or IPEM Diploma may apply, using appropriate documentary evidence, for module exemption through the Faculty's approved A(E)L/AL procedures.

Section 6: Assessment Regulations

This programme was originally developed under MAR and is now in line with the Academic Regulations and Procedures

Section 7: Student learning: distinctive features and support

Learning is based on a student-centred approach, where students are encouraged to take responsibility for their own learning. Students on the nuclear medicine programme actively participate in a dynamic and informative manner during their contact time at the University. This is facilitated by experienced lecturers from within the Allied Health Professions school and external clinical personnel from local and national departments. A lifelong learning culture is embedded within the nuclear medicine programme, providing students with the skills and knowledge to undertake future professional development after the completion of the course.

Students also utilise the University's virtual learning environment (Blackboard) as an asynchronous communication method between module delivery blocks. Students utilise the virtual learning environment in an effective way, ensuring preparation material for future module blocks is encompassed as part of their self-directed studying and helps to enhance their information technology skills. Peer support mechanisms are evident both during contact sessions at the University and via on-line discussion boards (Blackboard) and blogs.

Active participation and reflections on clinical practice is undertaken by students throughout the course, who generally adopt a more reflective and critical approach to their working practice as a result of undertaking the nuclear medicine course. Student representatives also attend Programme Management Committee meetings, inputting essential feedback and suggestions for future programme delivery.

Support for students in clinical practice is also ensured, via the involvement of designated clinical mentors. Clinical visits to departments are also undertaken by academic staff, ensuring mentors are provided with support and guidance if required. Organised appraiser days also help to ensure clinical mentors are kept up to date with clinical documentation and it also offers a forum whereby scenarios and queries can be discussed in a suitable environment.

The development of electronic objective structured clinical examinations (e-OSCE's) has previously been introduced as part of the reporting skills module assessment. This assessment format encompasses the modern developments of "soft copy" reporting now identified in most clinical departments and attempts to simulate aspects of a typical clinical environment. The e-OSCE assessment tool has evolved (with the valuable input of previous students and clinical staff) and currently includes advanced manipulation tools, such as video streaming and image windowing facilities.

Previous students who have successfully completed the nuclear medicine programme are utilised as a continuing source of clinical expertise and facilitate a useful reflective medium for current students. Student publication and further professional development is also encouraged and promoted by the University. Former students actively input into the current programme delivery and help explore future developments. Students are able to readily identify with past students, who offer additional support in an informative manner.

Various clinical professionals are involved in the delivery of the nuclear medicine programme and actively support the continued development of the programme. Involvement at Programme Management Committee meetings is valued and helps to form the basis of future programme deliveries.

Active links with clinical professionals, who support the nuclear medicine programme, has also resulted in the publication of various papers, which relate to aspects of current and developing clinical practice. In addition, collaboration with departments in the South West of the United Kingdom assisted in the undertaking of a regional survey exploring developing techniques in practice.

Section 8 Reference points/benchmarks

- *Subject benchmarks*

Quality Assurance Agency (2010) Master's Degree Characteristics [online] available from

<http://www.qaa.ac.uk/academicinfrastructure/benchmark/masters/MastersDegreeCharacteristics.pdf>

Quality Assurance Agency (2004) Code of practice for the assurance of academic quality and standards in higher education - Section 2: Collaborative provision and flexible and distributed learning (including e-learning) [online] available from:

<http://www.qaa.ac.uk/academicinfrastructure/codeOfPractice/section2/collab2004.pdf>

- *employer interaction/feedback:*

The programme team has received positive feedback from students and clinical service, via programme management committee meetings and module evaluations. Students completing module evaluation forms have been complimentary in terms of the organisation and overall delivery of the programme. Students have also praised the visiting lecturers and commented upon their calibre of teaching on the programme. In particular students have acknowledged the importance of ensuring the programme relates to modern clinical practice. Developments of the programmes content and learning styles have attempted to encompass such developments. Both students and clinical staff, who support the students, have also commented favourably upon the difference the programme has made to the overall working practice of practitioners who have attended the programme. Such differences are impacting upon routine clinical practice and helping to ensure practitioners obtain specialist roles / advance practice status within the work place.

The fact that further cohorts of students have enrolled on the programme from the same local NHS Trusts and recently a greater number of international of students indicates the levels of satisfaction from clinical service and reputation of the nuclear medicine programme. Trusts are also keen to see a progression to Masters level and there are an increasing number of students wishing to enrol on the research project module.

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of individual modules can be found in module specifications. These are available on the University Intranet.

Programme monitoring and review may lead to changes to approved programmes. There may be a time lag between approval of such changes/modifications and their incorporation into an authorised programme specification. Enquiries about any recent changes to the programme made since this specification was authorised should be made to the relevant Faculty Administrator.