

CORPORATE AND ACADEMIC SERVICES

PROGRAMME SPECIFICATION

Part 1: Basic Data	
Awarding Institution	University of the West of England
Teaching Institution	University of the West of England
Delivery Location	Frenchay and Glenside campuses
Faculty responsible for programme	Health and Life Sciences
Department responsible for programme	Applied Sciences
Modular Scheme Title	Undergraduate
Professional Statutory or Regulatory Body Links	Medical Education England Healthcare Science Programme Board.
<i>Name of PSRB</i>	Association of Respiratory Technology and Physiology
<i>Type of approval</i>	Society for Cardiological Science and Technology
Dates	
Highest Award Title	BSc (Hons) Healthcare Science (Physiological Sciences) with pathways in... BSc (Hons) Healthcare Science (Cardiac Physiology) BSc (Hons) Healthcare Science (Respiratory & Sleep Physiology)
Default Award Title	
Interim Award Titles	Cert.HE Healthcare Science Dip. HE Healthcare Science BSc. Healthcare Science
UWE Progression Route	N/A
Mode(s) of Delivery	Full time / Part time
Codes	UCAS: C991 JACS: C990 ISIS2: HESA:
Relevant QAA Subject Benchmark Statements	Biosciences, Biomedical Science, and Clinical Science
CAP Approval Date	16 May 2012 (Special Joint UWE CAP with the MSC Team)
Valid From	September 2012
Valid until Date	
Version	2

Part 2: Educational Aims of the Programme

The BSc (Hons) Healthcare Science (Physiological Sciences) programme is part of the university's extensive Healthcare, Biomedical and Biosciences provision to provide the principal training routes for Healthcare Science Practitioners. This exciting course is delivered through a unique collaboration between the University of the West of England and local NHS providers within the south-west region, and has been developed in direct response to the Modernising Scientific Careers programme at the Department of Health. This has been established to develop a common career pathway, education and training standards for Healthcare Scientists, and to improve patient protection and safety through better professional regulation. The degree programme enables students to develop the knowledge and skills required of a healthcare scientist whilst also completing the extensive work-based training that forms an integral and significant proportion of the three year course, and to demonstrate specified standards of practice.

Specifically, the programme aims to provide the students with:

- A broad knowledge base in healthcare sciences, including the application of physics to physiological measurement, with specific areas of deeper understanding relevant to the specialised pathways within physiological sciences.
- The opportunity to develop specialist skills and knowledge in the Cardiac or Respiratory & Sleep pathways of Healthcare Science (Physiological Sciences) through the provision of targeted work experience in healthcare science laboratories, and through the development of specialist knowledge particularly in the final year of study.
- Practical experience of working in a clinical environment through both an experiential placement within the first year to introduce Healthcare Science in practice and extended placements within one of the pathways in years 2 and 3, enabling the student to perform a wide range of relevant methods and techniques and to undertake a project in a working context.
- An understanding of the importance of effective communication, patient-centred care, evidence-based practice, clinical audit and multidisciplinary team working.
- The underpinning knowledge to enable students to gain the accompanying skills and attitudes to work as a Physiological Scientist.
- An excellent preparation for work after graduation with the opportunity for students to develop specialist knowledge and skills within pathways specifically designed for the pursuance of a career as a Healthcare Scientist in the NHS.

The programme offers a combination of modules enabling students to understand the science of the physiology and pathophysiology of relevant body systems and the application of technology, while working at the cutting edge of healthcare sciences using state-of-the-art equipment in a patient-facing environment.

Part 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:	
Learning Outcomes	Teaching, Learning and Assessment Strategies
A Knowledge and Understanding	
<p>A Knowledge and understanding of</p> <p>Students will be able to</p> <ol style="list-style-type: none"> 1. Demonstrate an underpinning knowledge of cell biology, anatomy, physiology, pharmacology and pathology that provides the foundations for study in the Physiological Sciences pathways of Healthcare Science. 2. Understand the context of healthcare sciences and their application to practical problems 3. Understand the importance of patient-centred care, evidence-based practice, clinical audit and multidisciplinary team working 4. Understand a broad range of diagnostic and therapeutic measurement techniques including the rationale for the investigation, modification of the investigation, interpretation of test results and treatment of disease 5. Demonstrate competence in specific areas of physiological measurement with an understanding of the clinical principles underlying the techniques used 6. Demonstrate an understanding of the research, development and innovation across the NHS and in healthcare science in particular 	<p>Teaching/learning methods and strategies:</p> <p>Acquisition of knowledge is achieved through a variety of methods including lectures, practicals, seminars, tutorials, case studies, observation, 'live' case study, project work, training placements and completion of their associated training portfolios. Additional support is provided through blended learning including Blackboard, the Profile website and VLEs such as 'Virtual Patient'</p> <p>Throughout, the learner 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.</p> <p>Assessment:</p> <p>Testing of the knowledge base is through assessed practical tasks, coursework and examinations as well as evidence supplied by the training portfolios. Assessment methods are specified in each module guide and are varied and designed to test the learning outcomes.</p>
B Intellectual Skills	
<p>B Intellectual Skills</p> <p>The ability to ...</p> <ol style="list-style-type: none"> 1. Actively question and seek information 2. Compare and contrast information from different sources 3. Critically evaluate information against hypotheses in a range of research scenarios 4. Actively analyse and apply problem-solving strategies 	<p>Teaching/learning methods and strategies:</p> <p>Intellectual skills are developed through student-centred learning and reflection, written assignments, practical work, data handling and interpretation, tutorial and seminar work. The research project is designed to permit students to demonstrate achievement of all the learning outcomes 1-6.</p>

Part 3: Learning Outcomes of the Programme	
5. Demonstrate independent and self-directed learning 6. Develop reflective skills	Assessment: A variety of assessment methods are employed. Some test a learner's ability to demonstrate skills 1-6 through examinations, but assessment of the training portfolios, coursework and practical project work including student oral presentation is the main vehicle for assessment of higher order skills.
C Subject, Professional and Practical Skills	
C Subject, Professional and Practical Skills The ability to ... 1. Critically observe, analyse and evaluate information arising from a wide range of sources. 2. Apply practical approaches to the study of selective aspects of healthcare science; demonstrate an awareness of health and safety in practice and the skills to undertake a clinical audit and multidisciplinary team working. 3. Communicate effectively scientific data and concepts using a range of communication strategies, showing awareness of the needs of the audience 4. Develop discipline-specific interests by specialising within the programme in relation to subject and/or career aspirations. 5. Obtain, record, collate and critically analyse data using appropriate assessment techniques, working as an individual or within a team. 6. Demonstrate an understanding of the research process, including the current ethical and legal frameworks within which research can be conducted in the UK, through the execution of a research project.	Teaching/learning methods and strategies: Skills 1-5 are acquired and developed in a coordinated and progressive way throughout the levels of the programme through lectures, tutorials, case studies, observations, 'live' case studies, practical and project work. At level 1 attention is focussed on the acquisition of basic skills and safe working practices through prescribed exercises, while at level 2 more advanced techniques and open ended practical work are introduced. Professional skills are central to the ethos of all Healthcare Science-specific modules as well as being acquired through appropriate clinical placements throughout the programme. The delivery of key specialist material by practicing clinical physiology teams ensures that theory is closely aligned to practice and that patient-centred and multidisciplinary team approaches are central concepts. The research project is pivotal to the acquisition and consolidation of skills 1-6 and is supported by research methods and data analysis modules at levels 1 and 2. Assessment: Skills 1, 2, 3, 4 and 5 are primarily assessed through practical reports, coursework and research projects – proposal, oral presentation and report. Professional Practice skills are further assessed through the training portfolios. Additionally, skill 6 is assessed in the research project.
D Transferable Skills and other attributes	
D Transferable Skills and other attributes The ability to...	Teaching/learning methods and strategies: Skills are developed throughout the programme via case studies, practicals, tutorials coursework

Part 3: Learning Outcomes of the Programme

1. Communicate information, advice, instruction and professional opinion effectively and appropriately to colleagues, patients, clients, users, their relatives and carers.	assignments, the Graduate Development Programme and appropriate clinical placements.
2. Critically analyse data arising from various means of biological inquiry	Assessment:
3. Undertake active learning and development	A range of assessment strategies are used
4. Apply information management skills	including essay, practical report, group work,
5. Practice effective time management	case study, oral presentation, reflection and self-
6. Work effectively as a team member.	evaluation, as well as the research project and
7. Demonstrate an autonomous and reflective approach to lifelong learning.	the training portfolios.

Part 4: Programme Structure

BSc (Hons) Healthcare Science (Physiological Sciences)

Compulsory

Level 1: All Pathways – Full Time Route

Intro to Biology of Disease USSJKT-20-1	Human Anatomy & Physiology USSJL-20-1	Cell Biology & Biochemistry USSJIM-20-1	Scientific Principles for Healthcare USSJSL-20-1	Introduction to Physiological Sciences USSJSE-20-1	Patient Care for Healthcare Science USSJY8-20-1
---	---	---	--	--	---

Interim award: **Certificate of Higher Education** 120 credits

Level 2: Cardiac Physiology Pathway

Measurement Techniques In Physiol. Sci. USSJSM-20-2	Experimental Design & Analysis USSJ4D-20-2	Pathophysiol. Common CVRS conditions USSJY7-20-2	Cardiac Physiology A USSJY5-20-2	Cardiac Physiology B USSJY6-20-2	Inter-professional Module A UZYSFD-20-2
---	--	--	--	--	---

Level 2: Respiratory and Sleep Physiology Pathway

Measurement Techniques in Physiol. Sci. USSJSM-20-2	Experimental Design & Analysis USSJ4D-20-2	Pathophysiol. Common CVRS conditions USSJY7-20-2	Respiratory & Sleep Physiology A USSJY9-20-2	Respiratory & Sleep Physiology B USSJYA-20-2	Inter-professional Module A UZYSFD-20-2
---	--	--	--	--	---

Interim award: **Diploma of Higher Education** 240 credits

Level 3: Physiological Sciences (Cardiac Physiology)


Healthcare Project USSJSJ-30-3	Professional Practice for Health Care Science USSJSK-30-3	Advanced Cardiac Physiology USSJY3-30-3	Applied Cardiac Physiology USSJY4-30-3
--	---	---	--

Level 3: Physiological Sciences (Respiratory and Sleep Physiology)

Healthcare Project USSJSJ-30-3	Professional Practice for Health Care Science USSJSK-30-3	Advanced Respiratory & Sleep Physiology USSJYB-30-3	Applied Respiratory & Sleep Physiology USSJYC-30-3
--	---	---	--

Degree with Honours 360 credits

This structure diagram demonstrates the student journey from Entry through to Graduation for a **full time student**, including: level and credit requirements, interim award requirements, module diet, including compulsory and optional modules

	ENTRY	<p>Compulsory Modules</p> <p>USSJKT-20-1 Intro to Biology of Disease USSJL-20-1 Human Anatomy & Physiology USSJM-20-1 Cell Biology & Biochemistry USSJSL-20-1 Scientific Principles for Healthcare USSJSE-20-1 Introduction to Physiological Sciences USSJY8-20-1 Patient Care for Healthcare Science</p>	<p>Optional Modules</p> <p>none</p>	<p>Interim Awards</p> <p>Cert HE Healthcare Science</p> <p>Credit requirements: 120 (not less than 100 at Level 1 or above)</p>
	Year 1	<p>Compulsory Modules (all pathways)</p> <p>USSJSM-20-2 Measurement Techniques In Physiological Sciences USSJ4D-20-2 Experimental Design & Analysis USSJY7-20-2 Pathophysiology of Common CVRS conditions UZYSFD-20-2 Inter-professional Module A</p> <p>Compulsory Modules (specific pathways)</p> <p>Students on the Cardiac Physiology pathway must also take: USSJY5-20-2 Cardiac Physiology A USSJY6-20-2 Cardiac Physiology B</p> <p>Students on the Respiratory and Sleep Physiology pathway must also take: USSJY9-20-2 Respiratory & Sleep Physiology A USSJYA-20-2 Respiratory & Sleep Physiology B</p>	<p>Optional Modules</p> <p>none</p>	<p>Interim Awards</p> <p>Dip HE Healthcare Science</p> <p>Credit requirements: 240 (not less than 100 at Level 2 or above, and 120 at Level 1 or above)</p>
	Year 2	<p>Compulsory Modules (all pathways)</p> <p>USSJSJ-30-3 Healthcare Project USSJSK-30-3 Professional Practice for Health Care Science</p> <p>Students on the Cardiac Physiology pathway must also take: USSJY3-30-3 Advanced Cardiac Physiology USSJY4-30-3 Applied Cardiac Physiology</p> <p>Students on the Respiratory and Sleep Physiology pathway must also take: USSJYB-30-3 Advanced Respiratory & Sleep Physiology USSJYC-30-3 Applied Respiratory & Sleep Physiology</p>	<p>Optional Modules</p> <p>none</p>	<p>Interim Awards</p> <p>BSc Healthcare Science</p> <ul style="list-style-type: none"> • Credit requirements: 300 (of which not less than 60 are level 3 or above, and 100 are at level 2 or above, and 120 are level 1 or above) <p>Award</p> <p>BSc (Hons) Healthcare Science (Cardiovascular Science) or BSc (Hons) Healthcare Science (Respiratory & Sleep Science)</p> <ul style="list-style-type: none"> • Credit requirements: 360 (not less than 100 at Level 3 or above, 100 at Level 2 or above, and 140 at Level 1 or above)
Year 3				

GRADUATION

Part 5: Entry Requirements

The University's Standard Entry Requirements apply with the following additions:

Admission into the Healthcare Science Programme will be administered within the Undergraduate Programmes in the Faculty of Health & Life Sciences.

Successful application to the Programme must meet one of the following minimum requirements

5 GCSEs at grade C or above including English Language, Mathematics and Double Science/Additional science or equivalent

PLUS

*Tariff points as appropriate for the year of entry (*refer to the UWE website <http://courses.uwe.ac.uk/C991/2012#entry>*) must include Chemistry and/or Biology

OR

Access Diploma: (*refer to UWE website for requirements*)

OR

European Baccalaureate 68-72 **must include** Science

*Non standard entry applicants may be considered with a lower tariff point on individual merit.

Applicants whose first language is not English must have a minimum IELTS score of 7 overall with a minimum of 6.5 in any section, (or equivalent).

All applicants must meet the following additional criteria:

- Occupational Health and Criminal Record Bureau checks will be undertaken on all candidates in accordance with university, faculty and programme policies.
- Admission to the course will be subject to interview for which the panel will comprise an academic and a professional from clinical practice.

Part 6: Assessment

A: Approved to University Regulations and Procedures

Assessment Map

*Assessment should be shown in terms of either **Written Exams**, **Practical exams**, or **Coursework** as indicated by the colour coding below.

**Assessed elements within the Training portfolio. P/F = Pass/Fail

Reflective

The programme encompasses a range of assessment methods including; (eg essays, posters, presentations, written examinations). These are detailed in the following assessment map:

Assessment Map for **Healthcare Science (Physiological Sciences) Cardiac Physiology, and Respiratory & Sleep Physiology**

		Type of Assessment*										
		Unseen Written Exam	In-class Personal Response Test	Practical Exam	Practical Skills Assessment	Practical Booklet	written Assignment	Data Analysis	Case Study	Report / Project	Poster presentation	Portfolio
Compulsory Modules Level 1	USSJIM-20-1	A (40)				B (30)		B (30)				
	USSJIL-20-1	A (40)								B (60)		
	USSJKT-20-1	A (40)									B (60)	
	USSJSE-20-1	A (40)								B (60)		
	USSJSL-20-1	A (40)							B (60)			
	USSJY8-20-1	A (40)										#B (60)
Compulsory Modules Level 2	USSJ4D-20-2	A (50)								B (20)	B (30)	
	USSJSM-20-2	A (50)	B (25)				B (25)					
	USSJY7-20-2	A (50)	B (20)								B (30)	
	UZYSFD-20-2									A (100)		
	USSJY5-20-2	A (50)							B (50)			
	USSJY6-20-2	A (50)							B (50)			
	USSJY9-20-2	A (50)							B (50)			
	USSJYA-20-2	A (50)							B (50)			
Compulsory Modules Level 3	USSJSJ-30-3									A (80)	A (20)	
	USSJSK-30-3			A P/F**	A P/F**		#B (33)		B (66)			A P/F
	USSJY3-30-3	A (60)							B (40)			
	USSJY4-30-3	A (60)							B (40)			
	USSJYB-30-3	A (60)							B (40)			
	USSJYC-30-3	A (60)							B (40)			

Part 7: Student Learning

Teaching, learning and assessment strategies to enable learning outcomes to be achieved and demonstrated

At UWE, Bristol there is a policy for a minimum average requirement of 12 hours/week contact time over the course of the full undergraduate programme. This contact time encompasses a range of face:face activities as described in the scheduled learning below. In addition a range of other learning activities, to include placement and independent learning, will be embedded within the programme which, together with the contact time, will enable learning outcomes to be achieved and demonstrated.

Scheduled learning includes lectures, seminars, tutorials, project supervision, demonstration, practical classes and workshops; external visits; work based learning. Scheduled sessions may vary slightly depending on the pathway choices made.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion, and engagement with Virtual Learning Environments such as 'Greenbank' and 'Virtual Patient'. Scheduled sessions may vary slightly depending on the module choices made.

Placement learning: Placements are an integral feature of this programme and are spread throughout the three levels as indicated below.

Level 1: 8 weeks, plus observational visits

Level 2: 15 weeks

Level 3: 25 weeks

Description of Distinctive Features and Support

The programme aligns with the accredited Healthcare Scientist training already in place at UWE in that work-based learning is fully integrated into the three-year programme, rather than being concentrated within an additional, sandwich placement year. Furthermore, the credit associated with work-based learning represents a significant proportion of the total credit for the course.

A suite of core modules in the first year provide students with the underpinning knowledge of anatomy, physiology, pharmacology, pathology, data analysis and patient-care, which are required for study in any of the Physiological Science pathways of Healthcare Science. Following discussion with service users, a Patient-care for Healthcare Science module has been developed and will incorporate lecture input from service users, and observational visits to practice to consolidate learning, supplemented by a reflective assessment. The first year incorporates "ten weeks" of experiential placement activity comprising 1 week in January and 6 weeks in the summer in local healthcare science settings, to introduce Healthcare Science in practice and give the student a wide appreciation of the pathways available within the Healthcare Science (Physiological Sciences) programme. The 6 week placement is preceded by a pre-placement training week at UWE covering areas such Basic Life Support, Manual Handling, Professionalism and Health and Safety. The remaining ten days are made up by the training opportunities gained through the programmes integrated observational visits within USSJY8-20-1 and practical classes introducing clinical equipment and related measurements within USSJSE-20-1 primarily.

The number of students recruited onto the full-time route will have been determined by the total number of placements available to us through the Workforce Development Groups. Within this total number students will know the breakdown of Cardiac and Respiratory & Sleep Physiology placements available and their first year learning experience at university and on placement will

Part 7: Student Learning

enable them to consider which divisions interest them. Interviews will be held as part of the allocation process for their subsequent study.

In the Second Year, all students study a suite of healthcare science and research skills modules alongside their specialism to underpin their practice during the 15-week long placement within their chosen pathway of the Physiological Sciences. This provides the student with practical experience of working in clinical physiology and the opportunity to consolidate their learning and to enhance their professional skills within the workplace. They are also able to undertake preparatory work for their final year project within their work environment. In the final year, students further develop their specialist knowledge by studying Physiological Science modules specific to their chosen pathway prior to their final placement. The final level 3 placement spans 25 weeks and incorporates the research project plus completion of the Placement Practice and Training portfolios.

Students in years 2 and 3 will benefit from being taught by specialist Clinical Physiologists from leading regional centres (Bristol Heart Institute; Department of Respiratory Medicine at University Hospitals Bristol). Moreover, in year 3 the specialist teaching will be delivered within these centres enabling students to benefit from current work-place technology and 'live' case teaching.

This integrated approach permits the development of expertise in applied scientific techniques within a discipline/pathway, enabling the graduate to work in a range of healthcare settings within a defined role in the delivery and reporting of quality-assured tests, investigations and interventions on patients. Students will be introduced to a range of analytical equipment through the use of skills laboratories in the university, with the placements concentrating on the application to clinical practice as well as learning with and through placement opportunities.

Whilst students are on clinical placement, a visiting tutor makes regular, planned visits to provide support and to liaise with supervisors and assessors. In addition, effective placement learning is fully supported through a variety of web-based approaches, including the Modernising Scientific Careers online assessment tool, and Blackboard (UWE's Virtual Learning Environment) used to evidence validate and assess learning within the Professional Practice Module.

There is an overarching SHA Learning Development Agreement between the university and hospital trusts which supports placement arrangements. In addition the obligations and responsibilities of the student, the placement training officer/supervisor and the University are clearly set out in a personal Learning Agreement drawn up between all three parties. This emphasises and encourages the student to take responsibility for the attainment of the learning outcomes.

Students are supported during their time at UWE by academic tutors, their programme manager and student advisers. The 'Graduate Development Programme' is a university-wide learning opportunity for students to support their learning, to offer guidance for their Personal Development Planning, and to enhance their employability. Students will meet programme-specific tutors on a regular basis throughout the course. Whilst on placement students are supported by Placement Training Officers and Academic Visiting Tutors. For all students, access to academic staff and student advisers is by student e-mail or by personal access, and the University's Centre for Student Affairs (CSA) provides support and guidance to students on a wide range of issues.

The libraries at Frenchay and Glenside campuses provide an extensive range of literature for the programme. Students have 24-hour access to computers, and IT support services are available within the Department of Applied Sciences and from the University's Computing Helpdesk.

Part 7: Student Learning

The Department has a well-equipped range of general laboratories, specialised scientific equipment and specialist facilities appropriate for teaching and research in biosciences and biomedicine, including physiology and has approved the further purchase of specialist equipment and redesign of specialist space to support this new programme. Provision for laboratory-based scientific inquiry is enhanced by the research focused modules that occur within each year. Students develop a range of key skills required of a healthcare scientist, including critical review, research methodology, problem-solving, and IT and communication skills.

A Student Handbook is provided, during Induction to year 1, which includes information on the Department, the University, its regulations and procedures. Subsequently, at each level, induction is provided to enable students to plan their study of modules as effectively as possible. A patterned calendar of assessments across the academic year is also produced. Detailed information is distributed in guides at the start of each module.

Professional Accreditation

Healthcare Science is accredited by Medical Education England Healthcare Science Programme Board. In meeting that accreditation UWE recognise the following:

“No condonment/compensation of modules and no aggregation of marks are permitted for degrees approved by Modernising Scientific Careers (MSC). Students must pass all modules to be eligible for the award of the MSC accredited degree. This approach is required irrespective of the HEI’s own academic regulations.”

Part 8: Reference Points and Benchmarks

The mission and vision of the University of the West of England is to

‘advance an inclusive, civilised and democratic society and its enrichment through education, consultancy and public service’

The University of the West of England aspires to be the partnership university of the South West and aims of the Department of Applied Sciences and the undergraduate programme in Healthcare Science (Physiological Sciences) are entirely consistent with this and are firmly set within this context.

- **Qualification descriptors used in the QAA Framework for Higher Education Qualifications**

The learning outcomes for the programme have been developed with reference to the qualification descriptors used in the QAA Framework for Higher Education Qualifications. The learning outcomes for modules at level one and level two have been considered to be consistent with the award of a Certificate in Higher Education and a Diploma in Higher Education, respectively. Graduates of the award will have acquired the knowledge and understanding, and gained the intellectual, subject, professional, practical and transferable skills listed in Section 3.

- **Modernising Scientific Careers Curriculum**

The programme has been closely designed against the learning outcomes and indicative content set out within the *Modernising Scientific Careers Programme for BSc (Hons) in Healthcare Science, Cardiovascular, Respiratory and Sleep Sciences (Physiological Sciences) 2011/12*

Part 8: Reference Points and Benchmarks

document, and competencies listed in the *Healthcare Science Practitioner Training Programme Training Manual 2011/12 for Physiological Sciences: Cardiovascular, Respiratory and Sleep Sciences*.

- **Subject benchmarks**

Biosciences - By definition, according to the Biosciences Benchmark Statement, the biosciences are “a family of methods and disciplines grouped around the investigation of life processes”; “practical and experimental subjects”; and “subjects that combine scientific rigour with an acceptance of diversity and variability”, all of which are fundamental principles for Healthcare Science. The following statement is relevant to this programme: “Studies in the biosciences encourage an understanding of multidisciplinary, an enquiring attitude and an appreciation of complexity. They require development of competence in team and individual working as well as in numeracy (often including information technology, statistics and bioinformatics). Programmes also develop proficiency in preparing reports in a written format for many different purposes and in delivering presentations”.

In relation to the benchmark threshold standard for degree programmes where the study of organisms is key, it is stated that students should be able to: “describe basic organism structure and diversity”; “describe mechanisms for the life processes and appreciate how the physiology of an organism fits it for its environment”; “show an appreciation of the integration of metabolism”; “show knowledge of the basic genetic principles relating to and evolution of the organisms studied”; and “appreciate the importance of the ‘behaviour’ of the organisms studied”. These threshold standards can be met through a range of modules within this programme.

The benchmark typical standard includes students being able to: “critically recount the interactions of structure and metabolic function at cellular and organism levels”; “describe and critically evaluate the evidence for the mechanisms of life processes”; “interpret the significance of internal and external influences on the integration of metabolism for survival and health”, “describe and analyse patterns of inheritance and complex genetic interactions”; and “critically assess the contribution of ‘behaviour patterns’ to survival and success”, which likewise map to compulsory modules within this programme.

Clinical Science - This benchmark statement describes the nature and standards of programmes of study and training in clinical science that lead to awards made by the Association of Clinical Scientists. Traditionally training for Clinical Physiologists has been at post-graduate level which is reflected within this QAA benchmark, with learning outcomes for cardiology physiologists and respiratory physiologists mapped to the Health Professions Council Standards of Proficiency. Certain of those learning outcomes are equally appropriate for the BSc Healthcare Science (Physiological Sciences) programme. Within the integrated degree level-1 introduces the scientific basis of healthcare. An experiential placement between level-1 and 2 enables students to experience the clinical interface with healthcare scientists, other health professionals and patients. During level-2 learning students increase the proportion of discipline-specific knowledge and develop the skills to gather relevant information from a wide range of sources including electronic data; use appropriate assessment techniques; undertake and record a thorough, systematic and detailed assessment using appropriate techniques and equipment; and analyse and evaluate the information collected.

The benchmark typical standard includes students being able to: deliver quality patient/client-centred care; practice in an anti-discriminatory manner; draw on appropriate knowledge and skills in order to make professional judgements; recognising the limits of their practice and knowing when to seek advice; summarise and present complex scientific ideas in an appropriate form, all

Part 8: Reference Points and Benchmarks

of which map to compulsory modules and the extended level 2 and 3 placements.

The benchmark statements concerning knowledge and understanding, including that the student will have a detailed knowledge of the “science underpinning the modality in which the registrant practices, relevant basic clinical medicine and the fundamental principles of clinical practice;” and “the principles and applications of scientific enquiry, including the evaluation of treatment efficacy and the research process” map to final year modules including the research project.

- **Subject benchmarks: Biomedical Sciences (BMS)**

Students on the Healthcare Science (Physiological Sciences) Cardiac, and Respiratory & Sleep (CRS) Physiology programme of study will gain an appreciation of biomedical science (BMS) as a “multidisciplinary approach to the study of human disease” and will also develop “an awareness of the current methods used for the laboratory investigation, diagnosis and monitoring of disease...” (Biomedical Science Benchmark Statement). There is an emphasis throughout this programme on the pathophysiology of key systems (CRS) and on the assessment, prevention, treatment and rehabilitation during and/or following illness.

Subject knowledge and understanding listings for BMS are grouped under two sub-headings, ‘Basic Knowledge’ and ‘Clinical Laboratory Specialities’. Basic Knowledge criteria map broadly and effectively to the Healthcare Science (Physiological Sciences) programme, and those for specific Clinical Laboratory Specialities are acquired through laboratory practical classes at levels 1 and 2.

The Basic Knowledge sub-headings are listed as human anatomy and physiology, cell biology, biochemistry, genetics, molecular biology, immunology and microbiology, many of which map to modules in this programme. The Basic Knowledge resultant standards map specifically to modules in the Healthcare Science (Physiological Sciences) programme, providing students with an integrated knowledge of the human body physiologically, anatomically and biochemically, at a cellular, molecular and genetic level, in health and pathologically.

The Clinical Laboratory Specialities comprise cellular pathology, clinical biochemistry, clinical immunology, haematology, transfusion science, clinical genetics and medical microbiology. The Clinical Laboratory Specialities resultant standards do not map in their entirety to modules within this programme, and this is not required for the Healthcare Science (Physiological Sciences) graduate. However, the key standards relating to clinical issues that are relevant to the area of clinical physiology are achieved through this programme. For example, “on graduating...students should be able to have an appreciation of how biochemical changes associated with disease are assessed in the clinical laboratory and how information about such changes is applied to the diagnosis and monitoring of disease”.

- **Health Professions Council Standards**

The BSc (Hons) Healthcare Science (Physiological Sciences) programme is consistent with the Health Professions Council standards, in particular:-

- Health Professions Council (2009) *Standards of Education and Training*
- Health Professions Council (2008) *Standards of Conduct, Performance, and Ethics*

- **University teaching and learning policies**

In line with the University’s teaching and learning policies, this programme takes a student-centred approach to learning by allowing students to take control of aspects of their learning and providing a learning environment that stimulates active participation and engagement in the

Part 8: Reference Points and Benchmarks

learning process. The programme seeks to create an environment that stimulates students to take responsibility for aspects of their learning, while lecturers take responsibility for facilitating that learning. Module learning outcomes have been designed to ensure that students meet the overall programme learning outcomes on completion of the programme.

A variety of assessment methods is incorporated within the programme to cater for a diversity of student strengths and abilities. The course team recognises the importance of both summative and formative assessment activity as an integral part of the learning and teaching process. All assessments comply with the University Assessment Policy and Academic Regulations and Procedures.

- **Staff research projects**

Academic staff who support the programme have specific expertise in their subject area. The modules are strongly underpinned by the research expertise of the programme team and specialist lecturers. The quality, management and enhancement (QME) of the provision is underpinned by staff development, including research. Staff development includes individual target setting via the personal development review, in-house training and support to attend external courses and conferences. The Faculty is supportive of staff development; each member of staff may call upon funds to support attendance at conferences etc. New academic staff undertake a one-year Professional Development PG Cert programme, which is accredited by the Higher Education Academy (HEA) and Associate Lecturers may take advantage of the 'mini' Academic Professional Development programme.

The majority of staff involved with the programmes are research active and the Faculty strongly supports the research activities via 4 Research Centers, 2 Institutes and 1 Centre of Excellence. This course will be particularly linked to the Centre for Research in Bioscience (CRIB). The Centre has an international reputation in biomedical, biosensing, plant, and environmental research which is evidenced by the outstanding achievement in RAE 2008. (submission to the UoA12 – Allied Health Professions and Studies). 65% of the research was rated as world leading or internationally recognized. According to the RAE 2008 outcomes, UWE has proportionately more internationally excellent research than any other University in the UK. Furthermore, the Times Higher Education RAE ratings placed our Biomedical Science research within the top 10% of University submissions.

CRIB also has close links with over 100 research, academic and industrial organizations in the UK, Europe, China, Malaysia, USA and other countries. CRIB is also actively involved in regional initiatives such as the Biomedical Innovation Network (led by UWE's Institute of Bio-Sensing Technology) and Bristol Health Partners. These will provide students with an opportunity to participate in research seminars, workshops and other events, contributing to enhancing students' experience, developing transferable skills and increasing employability.

- **Employer interaction/feedback**

The integrated nature of the programme necessitates ongoing and close liaison with employers of Healthcare Scientists. This is extremely important and is achieved in the following ways:

Informal links

A culture of two-way communication exists, and is encouraged, between University academic staff and healthcare practitioners, as evidenced by UWE's representation on the South West Regional MSC Implementation Board. In addition, UWE is a participant member of the Association of Clinical Physiology Educators who meet twice a year and who interact directly with the Registration Council for Clinical Physiologists Professional Bodies Education Committee (RCCP-PBEC). These and many other opportunities for sharing ideas and views exist and are

Part 8: Reference Points and Benchmarks

actively used to the advantage of all parties. Through the Educational Development Unit practitioners have been actively involved in the design, delivery and continued development of the Healthcare Science (Physiological Sciences) programme. Similarly, service users are consulted on a regular basis to ensure that the programme delivers training that matches service needs.

Formal links

The Joint Training Officer's Committee monitors and advises on the operation of the training places in accordance with agreed standards and policies. In addition, this committee provides a valuable forum for practitioners' views on the undergraduate provision and for discussion pertaining to development of the degree programme.

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, available on the University's website.