



## MODULE SPECIFICATION

Part 1: Information			
Module Title	Advanced Cardiac Physiology and Neurophysiology		
Module Code	USSJY3-30-3	Level	Level 6
For implementation from	2020-21		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Health & Applied Sciences	Field	Applied Sciences
Department	HAS Dept of Applied Sciences		
Module type:	Standard		
Pre-requisites	Cardiovascular Physiology and Pathophysiology A 2020-21, Cardiovascular Physiology and Pathophysiology B 2020-21, Pathophysiological Sciences A 2020-21, Pathophysiological Sciences B 2020-21		
Excluded Combinations	None		
Co- requisites	Applied Neurophysiology, Respiratory and Sleep Physiology 2020-21		
Module Entry requirements	None		

Part 2: Description
<p><b>Overview:</b> Pre-requisites: students must have taken USSKAW-30-2 Cardiac Physiology and Pathophysiology A and USSKAX-30-2 Cardiac Physiology and Pathophysiology B</p> <p>OR</p> <p>USSKL9-30-2 Pathophysiological Sciences A and USSKLA-30-2 Pathophysiological Sciences B</p> <p><b>Features:</b> Module Entry requirements: Level 5 (or equivalent) physiological sciences qualification</p> <p><b>Educational Aims:</b> On successful completion of this module students will be able to fulfil the learning outcomes from 1 of the following 2 Physiological Sciences themed units of study:</p> <p>Unit 1: Advanced Cardiac Physiology Unit 2: Advanced Neurophysiology</p> <p>Unit 1 aligns to the Healthcare Science (Physiological Sciences) Cardiac Physiology pathway. Unit 2 aligns to the Healthcare Science (Physiological Sciences) Neurophysiology pathway. (See Learning Outcomes).</p>

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**Outline Syllabus:** This module contains two distinct units, namely

Unit 1: Advanced Cardiac Physiology

Unit 2: Advanced Neurophysiology

Students complete one of these units as prescribed by their pathway. Unit 1 aligns to the Healthcare Science (Physiological Sciences) Cardiac Physiology pathway. Unit 2 aligns to the Healthcare Science (Physiological Sciences) Neurophysiology pathway.

The syllabus covers:

### 1. Advanced Cardiac Physiology (Cardiac Physiology pathway)

Cardiac Pacing:-

Basic electrophysiological concepts underlying pacing

Cardiac cycle and potentials

Equipment and set up

Principles and application of rhythm management devices

Pacing modes, codes, and timing cycles

Indications and techniques for permanent and temporary pacing

Haemodynamics of cardiac pacing

Indications and contraindications for device implantation

Implantation techniques and asepsis, and removal

Follow up assessment of pacemaker patients and troubleshooting

Principles and applications for use of Implantable cardioverter defibrillators and cardiac resynchronisation therapy

Introduction to echocardiography:-

The principles of ultrasound and echo modes

Introduction to windows and views, velocities and pressures

Indications for echo

Utilising echocardiography to assess pathophysiological cardiac conditions

Congenital heart disease:-

Paediatric ECG interpretation

Embryology

Circulatory changes at birth

Simple and complex cardiac abnormalities including: Atrial Septal Defects, Ventricular Septal Defects, Patent Ductus Arteriosus, Coarctation of the Aorta, Tetralogy of Fallot, Complex pathologies, Treatment and management

Physiology, pathophysiology and pharmacology relating to Inherited, Genetic and Acquired Heart conditions and cardiac output control

Pharmacology:-

Be able to describe and evaluate the mechanism of action and indications for cardiovascular drugs for a range of applications including: Hypertension, Heart failure, Anti-coagulents /anti-platelet, Inotropes, Rhythm control, Cardiac catheterisation lab pharmacology, Dyslipidaemias

Additionally, it is expected that students will integrate knowledge from both this unit and the co-requisite USSJY4- 30-3 Applied Cardiac Physiology module in order to fully understand the scientific basis and diagnosis of cardiac conditions.

### 2. Advanced Neurophysiology (Neurophysiology pathway)

Neuroanatomy and physiology and pathophysiology

Major and subdivisions of the brain

Peripheral nervous system: cranial and peripheral nerves, neuropathies and myopathies, roots and muscles

Embryology: neural tube, origins of neurones and glia, neural crest, cell migration, formation of brain and

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spinal cord, myelination

Cerebral circulation: control of cerebral circulation, effect of altered blood gases, measurement of cerebral

blood flow, CSF production, constituents, circulation and pressure

Functions of subcortical structures: extrapyramidal and pyramidal systems, cerebellum and related

pathways, disorders of movement

Neurological conditions, their pathology and treatment: epilepsy classification, treatment, infective, degenerative, cerebrovascular, space-occupying lesion (SOL), metabolic, demyelinating conditions, non-organic disorders

Psychology of disease

Psychosocial

Psychological

Additionally, it is expected that students will integrate knowledge from both this unit and the Applied Neurophysiology unit within the co-requisite USSJYC-30-3 module in order to fully understand the scientific basis and diagnosis of neurophysiological conditions.

**Teaching and Learning Methods:** Material within the module will be presented to the students in the form of lectures, clinical workshops and tutorials. These will be held in block weeks at certain points within semesters 1 and 2. The learning of lecture content will be reinforced by regular tutorials throughout the academic year, and time spent in independent learning by the directed reading of recommended texts and through the use of technology enhanced learning resources that will be provided online.

A number of relevant clinical sessions will be incorporated during the block teaching, in addition to the work based learning that must be achieved under supervision by a workplace supervisor. Clinical sessions will drive the acquisition of technical skills at both an individual and group working level.

The remainder of the independent learning time allocated to the module should be spent preparing for assessments (B1), and undertaking revision for the exam (A1).

Scheduled learning includes lectures, seminars, tutorials, clinical workshops, external visits, work based learning.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc. These sessions constitute an average time per level as indicated in the table below.

### Part 3: Assessment

The assessments within this module have been designed to show that the student has developed the required knowledge and clinical skills required to practice as a cardiac physiologist or neurophysiologist, as appropriate. There will be two components to the assessment of this module.

Component A will comprise of an examination. This examination will assess a broad knowledge base, and focus on data analysis and interpretation of clinical scenarios and case based material, in order to assess the understanding and application of specialist clinical knowledge.

Component B will comprise of an integrated case-study portfolio, which will include completion of a range of relevant clinical tasks undertaken in clinical workshops. The focus of the clinical workbook will be to analyse, assess, and interpret clinical data and patient scenarios. This is an essential requirement of a healthcare science practitioner.

Formative feedback is available to students throughout the module through group discussions, and in workshops. Students are provided with formative feed-forward for their exam through a revision and exam preparation session prior to the exam and through the extensive support materials supplied through Blackboard.

All work is marked in line with the Faculty's Generic Assessment Criteria and conforms to university policies for

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the setting, collection, marking and return of student work. Where an individual piece of work has specific assessment criteria, this is supplied to the students when the work is set.

This assessment strategy has been designed following best practice on effective assessment from JISC ( <http://www.jisc.ac.uk/whatwedo/programmes/elearning/assessment/digiassess.aspx> ) and The Open University's Centre for Excellence in Teaching and Learning ( <http://www.open.ac.uk/opencetl/centre-open-learningmathematics-science-computing-and-technology/activities-projects/e-assessment-learning-the-interactive-comp> ).

Technical design and deployment of the activities will also follow best practice developed at UWE by the Education Innovation Centre in collaboration with academic colleagues across the university. Staff guidance and support are already in place ( <http://info.uwe.ac.uk/online/Blackboard/staff/guides/summative-assessments.asp> ).

First Sit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		50 %	Integrated case study portfolio (Cardiac), integrated case study (Neurophysiology)
In-class test - Component A	✓	50 %	In-class assessment (3hours)
Resit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		50 %	Integrated case study portfolio
In-class test - Component A	✓	50 %	In-class assessment (3 hours)

### Part 4: Teaching and Learning Methods

Learning Outcomes	On successful completion of this module students will achieve the following learning outcomes:	
	<b>Module Learning Outcomes</b>	<b>Reference</b>
	Advanced Cardiac Physiology (Cardiac Physiology pathway): Discuss the key areas of physiology, pathophysiology and pharmacology related cardiac pacing, including bradycardia management	MO1
	Advanced Cardiac Physiology (Cardiac Physiology pathway): Discuss the key areas of physiology, pathophysiology and pharmacology relating to acquired and inherited cardiac abnormalities and their treatment and management	MO2
	Advanced Cardiac Physiology (Cardiac Physiology pathway): Discuss the differences between children and adults with respect to cardiac physiology and pathophysiology, with reference to a range of disease pathologies	MO3
	Advanced Cardiac Physiology (Cardiac Physiology pathway): Actively seek accurate and validated information from all available sources with respect to cardiac investigations	MO4
	Advanced Cardiac Physiology (Cardiac Physiology pathway): Select and apply appropriate analysis or assessment techniques and tools	MO5
	Advanced Cardiac Physiology (Cardiac Physiology pathway): Critically discuss the problems associated with the care of patients undergoing cardiac investigations or treatments	MO6
	Advanced Neurophysiology (Neurophysiology pathway): Describe the physiology of the blood–brain barrier and the cerebrospinal fluid (CSF) circulatory system	MO7
	Advanced Neurophysiology (Neurophysiology pathway): Explain the relationship between the dysfunction of subcortical structures and neurological symptomology	MO8
Advanced Neurophysiology (Neurophysiology pathway): Evaluate the current definition, classification and treatment of adult epilepsy	MO9	

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	Advanced Neurophysiology (Neurophysiology pathway): Appraise common neurological conditions and the evidence base that underpins treatment decisions	MO10
	Advanced Neurophysiology (Neurophysiology pathway): Evaluate the effect of levels of awareness and an abnormally altered patient psyche on the reliable measurement of physiological variables	MO11
	Advanced Neurophysiology (Neurophysiology pathway): Describe a range of neurological conditions, their pathology and treatment for which the EEG and evoked potentials have a diagnostic or monitoring role	MO12
	Advanced Neurophysiology (Neurophysiology pathway): Critically appraise the assessment and management needs of particular specialist populations in Neurophysiology, to include the challenges of ageing, dementia, culture and language	MO13
Contact Hours	<b>Independent Study Hours:</b>	
	Independent study/self-guided study	225
	<b>Total Independent Study Hours:</b>	225
	<b>Scheduled Learning and Teaching Hours:</b>	
	Face-to-face learning	75
	<b>Total Scheduled Learning and Teaching Hours:</b>	75
	<b>Hours to be allocated</b>	300
	<b>Allocated Hours</b>	300
	Reading List	<p>The reading list for this module can be accessed via the following link:</p> <p><a href="https://uwe.rl.talis.com/modules/ussjy3-30-3.html">https://uwe.rl.talis.com/modules/ussjy3-30-3.html</a></p>

### Part 5: Contributes Towards

This module contributes towards the following programmes of study: