

<b>1. Programme title</b>	MSc/PgDip/PgCert Cardiac Ultrasound
<b>2. Awarding institution</b>	Middlesex University
<b>3. Teaching institution</b>	Middlesex University
<b>4. Programme accredited by</b>	
<b>5. Final qualification</b>	MSc/PgDip/PgCert Cardiac Ultrasound
<b>6. Academic year</b>	2016/2017
<b>7. Language of study</b>	English
<b>8. Mode of study</b>	Full-time and Part-time

<b>9. Criteria for admission to the programme</b>
<p>i. A good honours degree (minimum 2.ii) or equivalent qualification, in a health or science-based subject; applicant must normally be a cardiac physiologist. Applications from other healthcare professionals (e.g. registered nurses, and medical practitioners) are also welcomed.</p> <p>ii Applicants with other qualifications and / or substantial work experience in cardiac physiology will also be considered under the Accreditation of Prior Experiential Learning (APEL) scheme. Past learning or experience will be mapped against existing programme modules within the programme and the mapping will be considered at the accreditation board.</p> <p>iii Overseas Candidates should also be competent in English and have achieved, as a minimum, as examples, one of the following standards: IELTS-7.0; TOEFL (IBT) – 87.</p> <p>iv. Applicants with a disability can enter the programme following assessment to determine if they can work safely in the laboratory. The programme team have experience of adapting teaching provision to accommodate a range of disabilities and welcome applications from students with disabilities.</p> <p>v. All applicants must have secured a relevant placement or employed in a department or service prepared and able to provide the clinical training before the start of the programme.</p>

<b>10. Aims of the programme</b>
<p>The programmes aim to prepare students for careers in academia, working in a cardiac physiology department or medical equipment sales.</p> <p>The PgCert aims to:</p> <ul style="list-style-type: none"> <li>• Equip students with a mastery of the fundamental principles and recent advances in cardiac ultrasound.</li> <li>• Give students a thorough grounding in the fundamental mechanisms underpinning the major pathological processes.</li> <li>• Provide students with sufficiently detailed information about the modern technologies used in diagnostics and research to enable them to solve complex problem related to disease investigation.</li> <li>• Allow students to develop mastery of communication, teamwork, writing and presentation.</li> </ul> <p>The PgDip/MSc aims to:</p> <ul style="list-style-type: none"> <li>• Equip students with a mastery of the fundamental principles and recent advances in cardiac ultrasound.</li> <li>• Give students a thorough grounding in the fundamental mechanisms underpinning the major pathological processes.</li> <li>• Provide students with sufficiently detailed information about the modern technologies used in diagnostics and research to enable them to solve complex problem related to disease investigation.</li> <li>• Enable students to understand and apply the principles of leadership and management, health and safety, quality control, research and statistical methods in their professional lives.</li> <li>• Enable students to critically evaluate legal requirements for human experiments and ethical issues relating to research with human subjects and human tissue.</li> </ul>

- Provide students with the tools to acquire the essential facts, concepts, principles and theories relevant to their chosen research project.
- Give students the ability to critically evaluate current research literature in cardiac physiology, and an acquisition of the skills for lifelong learning
- Allow students to develop mastery of communication, teamwork, writing and presentation.

**In addition, on completion of the MSc the successful student will:**

- Have acquired the design, critical analysis and practical skills necessary to carry out an individualised experimental research project
- Have developed the skills to evaluate literature in the context of their current research and propose new hypotheses relevant to their research.

<b>11. Programme outcomes</b>	
<p><b>A. Knowledge and understanding</b> On completion of this programme the successful student will have acquired mastery of:</p> <p><b>PgCert/PgDip/MSc</b></p> <ol style="list-style-type: none"> <li>1. The anatomy, physiology and aetiology and pathology of common diseases related to cardiac ultrasound</li> <li>2. Ethical and legal issues in cardiac physiology</li> <li>3. Equipment, advanced diagnostic techniques and therapeutic interventions used in cardiac physiology.</li> </ol> <p><b>PgDip/MSc</b></p> <ol style="list-style-type: none"> <li>4. Research methods</li> <li>5. Clinical leadership and management</li> </ol>	<p><b>Teaching/learning methods</b> Students gain knowledge and understanding through lectures, seminars and laboratory work, self study (both directed and self-directed) and online learning.</p> <p><b>Assessment Method</b> Students' knowledge and understanding is assessed by both summative and formative assessments, which include seminar presentations, written assignments including laboratory reports, seen practical and theory examinations.</p>
<p><b>B. Cognitive (thinking) skills</b> On completion of the programme the successful student will be able to:</p> <p><b>PgCert/PgDip/MSc</b></p> <ol style="list-style-type: none"> <li>1. Develop ideas through the evaluation of appropriate literature, concepts and principles</li> <li>2. Present, analyse and critically evaluate physiological data</li> <li>3. Critically assess health risk factors associated with working in a research or clinical setting</li> </ol> <p><b>PgDip/MSc</b></p> <ol style="list-style-type: none"> <li>4. Design a research project</li> <li>5. Debate ethical and legal issues in cardiac physiology</li> <li>6. Develop a research project</li> </ol> <p><b>MSc</b></p> <ol style="list-style-type: none"> <li>7. Propose new hypotheses relevant to discipline</li> <li>8. Critically evaluate their research findings in the context of the literature research</li> </ol>	<p><b>Teaching/learning methods</b> Students learn cognitive skills through analysis of research literature and undertaking a research project that they have designed themselves, including consideration of the inherent ethical and health and safety implications.</p> <p><b>Assessment Method</b> Students' cognitive skills are assessed by written work, examinations, presentations and a research project.</p>
<p><b>C. Practical skills</b> On completion of the programme the successful student will be able to:</p> <p><b>PgCert/PgDip/MSc</b></p> <ol style="list-style-type: none"> <li>1. Competently perform advanced diagnostic or therapeutic procedures in accordance with health and safety guidelines</li> </ol>	<p><b>Teaching/learning methods</b> Students learn practical skills through laboratory practical classes, and undertaking a research project.</p> <p><b>Assessment Method</b> Students' practical skills are assessed by laboratory reports and dissertation.</p>

<p>2. Recognise and respond to moral, ethical and safety issues, which directly pertain to cardiac physiology</p> <p>3. Correctly perform calibration, safety testing, quality control and assurance procedures relating to physiological science services</p> <p><b>MSc</b></p> <p>4. Carry out experimental research</p>	
<p><b>D. Professional Skills</b></p> <p>On completion of this programme the successful student will be able to:</p> <p><b>PgCert/PgDip/MSc</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate effective communication and presentation skills</li> <li>2. Demonstrate leadership and managerial skills</li> <li>3. Demonstrate competence in the use of information technology</li> <li>4. Demonstrate numeracy and problem solving skills at a high level</li> </ol> <p><b>MSc</b></p> <ol style="list-style-type: none"> <li>5. Manage a research project and demonstrate a high level of research skills</li> </ol>	<p><b>Teaching/learning methods</b></p> <p>Students acquire graduate skills through lectures, seminars, practical laboratory work, literature searches, peer presentations, videos and online presentations, research project</p> <p><b>Assessment method</b></p> <p>Students' graduate skills are assessed by presentations, self-assessment and project work.</p>

<p><b>12. Programme structure (levels, modules, credits and progression requirements)</b></p>
<p><b>12. 1 Overall structure of the programme</b></p>
<ul style="list-style-type: none"> <li>• All programmes can be studied over either one-year full time or normally two years part time.</li> <li>• For a PgCert in Cardiac Ultrasound, full-time students will need to pass the three specialist modules in cardiac ultrasound including the clinical practice module. Part-time students are required to pass 30 credits per year.</li> <li>• Full-time PgDip and MSc students will take the four core modules and the three specialist modules. In addition, the MSc students will complete a 60-credits project module during the summer term. Students cannot start their research projects until they have passed all taught modules.</li> <li>• Part-time PgDip and MSc students will be expected to pass 60 credits of taught modules each year. MSc students will undertake a research project during summer term of the second year.</li> <li>• The total number of credits required for an award is: 60 credits for a PgCert; 120 for the PgDip; and 180 for the MSc.</li> </ul>

<b>12.2 Levels and modules</b>		
Level 7		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
All students must complete the 4 modules that form one of the specialisms in order to gain the PgCert Cardiac Ultrasound: BMS4057 BMS4087	Students must choose either BMS4097 or BMS4077.	
All students must complete the following for the PgDip in Cardiac Ultrasound: BMS4057 BMS4087 BMS4667 BMS4777 BMS4887 BMS4957	Students must choose either BMS4097 or BMS4077.	Successful completion of all modules
All students must complete the following for the MSc in Cardiac Ultrasound: BMS4057 BMS4087 BMS4667 BMS4777 BMS4887 BMS4957 BMS4997	Students must choose either BMS4097 or BMS4077.	Successful completion of all modules

### **12.3 Non-compensatable modules (note statement in 12.2 regarding FHEQ levels)**

<b>Module level</b>	<b>Module code</b>
7	<i>All modules</i>

### **13. A curriculum map relating learning outcomes to modules**

See Curriculum Map attached.

### **14. Information about assessment regulations**

The assessment regulations are the general university regulations.

### **15. Placement opportunities, requirements and support**

Not-applicable

### **16. Future careers**

A qualification at master's level is increasingly becoming a requirement for progression via a PhD into a research career. A master's degree is also an important means for health care professionals to develop the skills necessary to progress from practitioner to highly specialist practitioner.

### **17. Particular support for learning (if applicable)**

We have specialist laboratory facilities for the development of practical skills. Middlesex University Library will provide access to specialist journals. For ease of access for students based at Hendon, the library has facilities for inter-library photocopying of any articles required. Other articles may be obtained from the British Library in London where a similar arrangement for photocopying articles exists. A student may undertake a research project at their workplace where relevant and possible.

Applicants with a disability can enter the programme following an assessment of their needs, and to determine if they can work safely in the laboratory. The programme team have experience of adapting the programme to accommodate a range of disabilities in students on the cardiac physiology programmes and welcome applications from such students.  
 Learning resource services and facilities at Middlesex include a CAL suite and internet access as well as English learning and Language Support  
 Learning resources and other support for modules is delivered via myUniHub.

<b>18. JACS code (or other relevant coding system)</b>	Cardiology B810
<b>19. Relevant QAA subject benchmark group(s)</b>	

<b>20. Reference points</b>
<p>The following reference points were used in designing the Programme:</p> <p><b>Internal documentation:</b></p> <ul style="list-style-type: none"> <li>i. Middlesex University (2006) <i>Learning Framework Document</i></li> <li>ii. Middlesex University (2015) <i>Middlesex University Regulations</i>. MU</li> <li>iii. Middlesex University (2015) <i>CLQE Handbook</i>. MU</li> </ul> <p><b>External Documentation:</b></p> <ul style="list-style-type: none"> <li>1. Quality Assurance Agency (2001) <i>The QAA Framework for framework for higher education qualifications in England, Wales and Northern Ireland</i>. QAA</li> <li>2. Department of Health (DH) (2013) <i>Modernising Scientific Careers. Scientist Training Programme MSc in Clinical Science Curriculum. Cardiac, Critical Care, Vascular, Respiratory and Sleep Sciences 2013/14</i>. DH</li> <li>3. Department of Health (DH) (2013) <i>Modernising Scientific Careers Scientist Training Programme. MSc in Clinical Science Curriculum. Neurosensory Sciences 2013/14</i>. DH</li> </ul>

Please note programme specifications provide a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve if s/he takes full advantage of the learning opportunities that are provided. More detailed information about the programme can be found in the student programme handbook and the University Regulations.

## Curriculum map for MSc Cardiac Ultrasound

This section shows the highest level at which programme outcomes are to be achieved by all graduates, and maps programme learning outcomes against the modules in which they are assessed.

### Programme learning outcomes

Knowledge and understanding		Practical skills	
A1	The anatomy, physiology and aetiology and pathology of common diseases related to cardiac ultrasound	C1	Competently perform advanced diagnostic or therapeutic procedures in accordance with health and safety guidelines
A2	Ethical and legal issues in cardiac physiology	C2	Recognise and respond to moral, ethical and safety issues, which directly pertain to the cardiac physiology
A3	Equipment, advanced diagnostic techniques and therapeutic interventions used in cardiac physiology	C3	Correctly perform calibration, safety testing, quality control and assurance procedures relating to physiological science services
A4	Research methods	C4	Carry out research experiments
A5	Clinical leadership and management		
Cognitive skills		Professional skills	
B1	Develop ideas through the evaluation of appropriate literature, concepts and principles	D1	Demonstrate effective communication and presentation skills
B2	Present, analyse and critically evaluate physiological data	D2	Demonstrate leadership and managerial skills
B3	Critically assess health risk factors associated with working in a research or clinical setting	D3	Demonstrate competence in the use of information technology
B4	Design a research project	D4	Demonstrate a high level of numeracy and problem solving skills
B5	Debate ethical and legal issues in cardiac physiology	D5	Manage a research project and demonstrate a high level of research skills
B6	Develop a research project		
B7	Propose new hypotheses relevant to discipline		
B8	Critically evaluate research findings in the context of the literature research		

## PgCert Cardiac Ultrasound

Programme outcomes																									
A1	A2	A3	A4	A5		B1	B2	B3	B4	B5	B6	B7	B8		C1	C2	C3	C4		D1	D2	D3	D4	D5	
Highest level achieved by all graduates																									
7	7	7	7	7		7	7	7	7	7	7	7	7		7	7	7	7		7	7	7	7	7	

### PgCert Cardiac Ultrasound

Module Title	Module Code by Level	Programme outcomes																									
		A1	A2	A3	A4	A5		B1	B2	B3	B4	B5	B6	B7	B8		C1	C2	C3	C4		D1	D2	D3	D4	D5	
Cardiac Ultrasound Theory	BMS4057	x		x				x	x	x							x		x					x	x		
Cardiac Ultrasound Practice	BMS4087	x		x				x	x	x							x		x					x	x		
Advanced Clinical Skills	BMS4077	x	x	x				x	x	x							x	x	x				x	x	x	x	
Clinical Practice	BMS4097	x	x	x				x	x	x							x	x	x				x	x	x	x	

### PgCert Cardiac Rhythm Management and Electrophysiology

Module Title	Module Code by Level	Programme outcomes																									
		A1	A2	A3	A4	A5		B1	B2	B3	B4	B5	B6	B7	B8		C1	C2	C3	C4		D1	D2	D3	D4	D5	
Clinical Electrophysiology	BMS4067	x		x				x	x	x							x		x					x	x		
Cardiac Rhythm Management	BMS4007	x		x				x	x	x							x		x					x	x		
Advanced Clinical Skills	BMS4077	x	x	x				x	x	x							x	x	x				x	x	x	x	
Clinical Practice	BMS4097	x	x	x				x	x	x							x	x	x				x	x	x	x	

## PgDip/MSc Cardiac Ultrasound

Programme outcomes																									
A1	A2	A3	A4	A5		B1	B2	B3	B4	B5	B6	B7	B8		C1	C2	C3	C4		D1	D2	D3	D4	D5	
Highest level achieved by all graduates																									
7	7	7	7	7		7	7	7	7	7	7	7	7		7	7	7	7		7	7	7	7	7	

Module Title	Module Code by Level	Programme outcomes																									
		A1	A2	A3	A4	A5		B1	B2	B3	B4	B5	B6	B7	B8		C1	C2	C3	C4		D1	D2	D3	D4	D5	
Laboratory Leadership and Management	BMS4667					X		X		X		X						X					X				
Biomedical Ethics and Law	BMS4777		X					X				X						X									
Experimental Design and Statistics	BMS4887				X				X		X		X					X	X			X		X	X	X	
Research Project	BMS4997		X		X				X	X	X		X	X	X			X		X		X			X	X	
Advanced Signal Processing	BMS4957			X				X	X	X									X			X		X	X		
Cardiac Ultrasound Theory	BMS4057	X		X				X	X	X							X		X					X	X		
Cardiac Ultrasound Practice	BMS4087	X		X				X	X	X							X		X					X	X		
Advanced Clinical Skills	BMS4077	X	X	X				X	X	X							X	X	X			X	X	X	X		
Clinical Practice	BMS4097	X	X	X				X	X	X							X	X	X			X	X	X	X		