MSc Cardiac Rhythm Management and Electrophysiology

Programme Specification

1. Programme title	*MSc Cardiac Rhythm Management and Electrophysiology* *PGDip Cardiac Rhythm Management and Electrophysiology* *PGCert Cardiac Rhythm Management and Electrophysiology*
2. Awarding institution	Middlesex University
3a. Teaching institution	*Hendon*
3b. Language of study	*English*
4a. Valid intake dates	*September 2021*
4b. Mode of study	*Full time and Part time for each intake*
5. Professional/Statutory/Regulatory body	N/A
6. Apprenticeship Standard	N/A
7. Final qualification(s) available	*MSc Cardiac Rhythm Management and Electrophysiology* *PGDip Cardiac Rhythm Management and Electrophysiology* *PGCert Cardiac Rhythm Management and Electrophysiology*
8. Year effective from	**2021**

9. Criteria for admission to the programme

Applicants for all programmes:

- Must have minimum 2:2 undergraduate degree in a science based subject
  or
- PGCert Cardiac Rhythm Management and Electrophysiology for PGDip or MSc
  or
- PGDip Cardiac Rhythm Management and Electrophysiology for MSc

Practitioners with other qualifications, professional body accreditation and/or substantial work experience in Cardiac Rhythm Management or Electrophysiology can be considered under the Recognition of Prior Learning (RPL) scheme. Past learning or

experience will be mapped against existing programme modules within the programme and the mapping will be considered at the RPL board. For the Clinical Practice module, some of part of the module professional requirements may be determined via RPL on an individual basis.

Credits from entry qualifications such as PGCert and PGDip will also be considered at the RPL board

This is a specialist programme for ***current*** practitioners in Cardiac Rhythm Management or Electrophysiology only.

Overseas Candidates should also be competent in English and have achieved, as a minimum, IELTS Overall 6.5 with a minimum 6.0 in each component – or an equivalent qualification

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.

10. Aims of the programme

The programme aims to prepare students for career progression in the field of Cardiology or careers in areas such as academia and medical research.

PGCert Cardiac Rhythm Management and Electrophysiology aims to:

- Equip students with a mastery of the fundamental principles and recent advances in cardiac rhythm management and electrophysiology.
- Give students a thorough grounding in the fundamental mechanisms underpinning the major pathological processes
- 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
- Allow students to develop mastery of communication, teamwork, writing and presentation.

In addition, PGDip Cardiac Rhythm Management and Electrophysiology aims to:

- 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.
- Enable students to critically evaluate legal requirements for human experiments and ethical issues relating to research with human subjects and human tissue.
- 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 rhythm management and electrophysiology and an acquisition of the skills for lifelong learning

In further addition, the successful MSc Cardiac Rhythm Management and Electrophysiology 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.

11. Programme outcomes*

A. Knowledge and understanding On completion of this programme the successful student will have knowledge and understanding of : **PGCert/ PGDip/ MSc** 1. The aetiology and pathology of conduction system diseases. 2. The complexities of the cardiac conduction system 3. The pathology of both atrial and ventricular arrhythmia 4. Advanced cardiac imaging modalities used in modern cardiology **PGDip and MSc only** 5. Equipment, advanced diagnostic techniques and therapeutic interventions used in cardiac rhythm management and electrophysiology 6. The importance of calibration, safety testing, quality control and assurance procedures relating to physiological science services 7. The ethical and legal issues related to the collecting, handling and storing of data. 8. Research methods. 9. Clinical leadership and management **MSc only** 10. Designing and conducting an original research project	**Teaching/learning methods** Students gain knowledge and understanding through: attending lectures participatory seminars small group discussions directed learning group and individual exercises interactive activities and workshops **Assessment methods** Students' knowledge and understanding is assessed by: seminar presentations laboratory investigations written assignments unseen examinations data analysis project work.
B. Skills On completion of this programme the successful student will be able to: **PGCert/ PGDip/ MSc** 1. Display mastery of the complex and specialised areas of knowledge and skills related to cardiac rhythm management and electrophysiology. 2. Critically assess conduction system disease processes through advanced technical or professional activity, accepting accountability for related decision making. 3. Debate ethical and legal issues in cardiac rhythm management.	**Teaching/learning methods** Students learn skills through: • lectures • group discussions • formative assessment • peer-review of seminar presentations • directed reading • self-directed study • reflection • individual project

4. Propose new hypotheses relevant to discipline. 5. Present, analyse and critically evaluate physiological data **PGDip and MSc only** 6. Design and develop a research project; present and critically evaluate the research findings. 7. Recognise and respond to moral, ethical and safety issues, which directly pertain to cardiac rhythm management and electrophysiology 8. Critically assess health risk factors associated with working in a research or clinical setting 9. Demonstrate effective communication and presentation skills 10. Demonstrate leadership and managerial skills 11. Demonstrate competence in the use of information technology 12. Demonstrate numeracy and problem solving skills at a high level 13. Reflect on and evaluate own practice **MSc only** 14. Manage a research project and demonstrate a high level of research skills 15. Critically evaluate research findings in the context of the literature research	**Assessment methods** Students' skills are assessed by: • written assignments • peer and self-assessment • unseen examinations • case studies • research project Additionally, clinical assessment for practitioners requires log book of own case studies which incorporates data analysis, interpretation and reflective practice.

12. Programme structure (levels, modules, credits and progression requirements)

12. 1 Overall structure of the programme

- All programmes can be studied over either one-year full time or two years part time.

- PgCert Cardiac Rhythm Management & Electrophysiology (60 credits):
  - **Full-time** students will take the two 15-credits and one 30 credits specialist modules in one year.
  - **Part-time** students will normally take the two 15 credits modules in one year then the 30 credits modules in the other. The order in which this is done is the student's choice, but 30 credits must be undertaken in each year.

- PgDip Cardiac Rhythm Management and Electrophysiology (120 credits):
  - **Full-time** students will take the four core modules at 15 credits each and the three specialist modules of 2x 15 credits and 1x 30 credits over one academic year.
  - **Part-time** students will take modules equating to 60 credits in each of the two years.
  - It is recommended that this be the 3 specialist modules of 2x 15 credits and 1x 30 credits in Year 1 and the 4 core modules of 15 credits each in Year 2. This

recommendation will mean that should the student be unable to continue with study after Year 1, they will at least be awarded PGCert Cardiac Rhythm Management and Electrophysiology.

- MSc Cardiac Rhythm Management and Electrophysiology (180 credits):
  - **Full-time** students will take the four core modules at 15 credits each and the three specialist modules of 2x 15 credits and 1x 30 credits over one academic year.
  - Students will start their research project (60 credits) once all taught modules have been passed.
  - **Part-time** students will take modules equating to 60 credits in each of the two years.
  - It is recommended that this be the 3 specialist modules of 2x 15 credits and 1x 30 credits in Year 1 and the 4 core modules of 15 credits each in Year 2. This recommendation will mean that should the student be unable to continue with after Year 1, they will at least be awarded PGCert Cardiac Rhythm Management and Electrophysiology.
  - Students will undertake a research project worth 60 credits, once all taught modules have been passed.

PgDip/MSc Cardiac Rhythm Management and Electrophysiology (Full-time) October Start

Term 1 (Autumn term - October)

BMS4887 Experimental Design and Statistics 15 credits	BMS4597 Cardiac Imaging and Diagnostics 15 credits	BMS4007 Cardiac Rhythm Management 15 credits	BMS4097 Clinical Practice 30 credits

Term 2 (Winter term - January)

BMS4777 Biomedical Ethics and Law 15 credits	BMS4677 Leadership and Management 15 credits	BMS4067 Clinical Electrophysiology 15 credits

Term 3 (Summer - June) (MSc only)

BMS4997 Research Project 60 credits

PgDip/MSc Cardiac Rhythm Management and Electrophysiology

(Part-time) October Start

YEAR 1 – Specialist Modules
Term 1 (Autumn term - October)

BMS4007 Cardiac Rhythm Management 15 credits	BMS4097 Clinical Practice 30 credits

YEAR 2 – Core Modules
Term 1 (Autumn term - October)

BMS4887 Experimental Design and Statistics 15 credits	BMS4597 Cardiac Imaging and Diagnostics 15 credits

Term 2
(Winter term - January)

BMS4067
Clinical
Electrophysiology
15 credits

Term 2
(Winter term - January)

BMS4777
Biomedical
Ethics and Law
15 credits

BMS4677
Leadership and
Management
15 credits

Term 3 (Summer - June) (MSc only)

BMS4997
Research Project
60 credits

PgCert Cardiac Rhythm Management and Electrophysiology

Full-time – October start

Part-time - October start

Students can choose order of modules taken, but 30 credits must be undertaken in each year

Term 1
(Autumn term - October)

BMS4007
Cardiac Rhythm
Management
15 credits

BMS4097
Clinical
Practice
30 credits

Term 2
(Winter term - January)

BMS4067
Clinical
Electrophysiology
15 credits

Year 1: Term 1&2
(Autumn Term – October)

BMS4007
Cardiac Rhythm
Management
15 credits

(Winter term – January)

BMS4067
Clinical
Electrophysiology
15 credits

Year 2: Terms 1&2

BMS4097
Clinical
Practice
30 credits

The total number of credits required for each award is as follows:

PGCert Cardiology: 60 credits

PGDip Cardiology: 120 credits

MSc Cardiology: 180 credits

12.2 Levels and modules		
Level 7		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
All students must complete the 3 specialist modules in order to gain **PgCert Cardiac Rhythm Management and**	There are no optional modules	All modules must be passed to exit with PGCert CRM&EP award.

Electrophysiology (CRME&EP): BMS4097 Clinical Practice BMS4007 Cardiac Rhythm Management BMS4067 Clinical Electrophysiology		On passing all modules, students can opt to progress to PGDip CRM&EP or MSc CRM&EP
Level 7		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
All students must complete the following modules for the PgDip Cardiac Rhythm Management and Electrophysiology: **CORE MODULES** BMS4677 Leadership and Management BMS4777 Biomedical Ethics and Law BMS4887 Experimental Design and Statistics BMS4597 Cardiac Imaging and Diagnostics **SPECIALIST MODULES** BMS4097 Clinical Practice BMS4007 Cardiac Rhythm Management BMS4067 Clinical Electrophysiology	There are no optional modules	All modules must be passed to exit with PGDip CRM&EP award. On passing all modules, students can opt to progress to MSc CRM&EP.
Level 7		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
All students must complete the following modules for the MSc Cardiac Rhythm Management and Electrophysiology: **CORE MODULES** BMS4677 Leadership and Management BMS4777 Biomedical Ethics and Law BMS4887 Experimental Design and Statistics BMS4597 Cardiac Imaging and Diagnostics **SPECIALIST MODULES** BMS4097 Clinical Practice BMS4007 Cardiac Rhythm Management BMS4067 Clinical Electrophysiology BMS4997 Research Project	There are no optional modules	Students must pass all taught models before they can progress onto the project stage. Progression onto the project stage is not compulsory and students can opt to exit with PGDip CRM&EP award Students must pass the project module to exit with MSC CRM&EP award.

12.3 Non-compensatable modules	
Module level	**Module code**
7	There are no compensatable modules

13. Information about assessment regulations
This programme will run in line with general University Regulations: **https://www.mdx.ac.uk/__data/assets/pdf_file/0040/577687/Regulations-2020-21.pdf**

14. Placement opportunities, requirements and support (if applicable)

Not applicable – there are no placement opportunities with this programme

15. Future careers / progression

Successful MSc students will be equipped to progress to PhD programmes in cardiology or the specialised area of cardiac rhythm management and electrophysiology.

The programme is designed to help practitioner students with clinical professional development, in cardiac rhythm management and electrophysiology. For those that work in the NHS a master's degree is also an important means for health care professionals to develop skills necessary to progress from practitioner to highly skilled practitioner and beyond Band 7 into senior management.

Other possible careers include working as a cardiac researcher in academia, private sector biotechnology, or the pharmaceutical sector, should the practitioner want a change of direction.

16. Particular support for learning (if applicable)

Specialist laboratory facilities equipped with professional standard software and hardware. Students will have access to the online platform Epicardio© to assist with developing practical skills, knowledge and understanding in ECG, cardiac rhythm management and electrophysiology. Teaching is delivered by specialised practitioners.

The Clinical Practice module allows the practitioner student to use their own practice as part of the learning process via the Clinical Log-Book, a record of all work carried out during study.

Students may undertake a research project at their workplace where relevant and possible such as a service improvement audit, or take a role in an existing research project.

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.

Learning resources and other support for modules is delivered via myUniHub

The Learner Enhancement Team (LET) can provide one-to-one tutorials and workshops for those students needing additional support with literacy and numeracy.

Self-service laptops are available for loan for a maximum of 24 hours

Disability and Dyslexia Service aims to provide an inclusive teaching and learning environment which caters for all students.

17. JACS code (or other relevant coding system)	Cardiology B810
18. Relevant QAA subject benchmark(s)	There is no relevant benchmark for this subject

19. Reference points

Internal documentation

Middlesex University (2019) *Middlesex University Regulations.* London, MU
Middlesex University (2019) *Learning and Quality Enhancement Handbook.* London, MU
Middlesex University (2019) *Medical Science and Technology Learning, Teaching and Assessment Strategy*. S&T

External documentation

Quality Assurance Agency (2008) *Framework for Higher Qualification.* London, QAA
Quality Assurance Agency (2015) Characteristics Statement. Master's Degree. London, QAA
Department of Health (DH) (2016) *Modernising Scientific Careers. Scientist Training Programme MSc in Clinical Science Curriculum. Cardiac, Critical Care, Vascular, Respiratory and Sleep Sciences2016/17.* DH

20. Other information

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 rest of your programme handbook and the university regulations.

Curriculum map for MSc Cardiac Rhythm Management and Electrophysiology

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	
A1	The aetiology and pathology of common conduction system diseases
A2	The complexities of the cardiac conduction system
A3	The pathology of both atrial and ventricular arrhythmia
A4	Advanced cardiac imaging modalities used in modern cardiology
A5	Equipment, advanced diagnostic techniques and therapeutic interventions used in cardiac rhythm management and electrophysiology
A6	The importance of calibration, safety testing, quality control and assurance procedures relating to physiological science services
A7	The ethical and legal issues related to the collecting, handling and storing of data
A8	Research methods.
A9	Clinical leadership and management
A10	Designing and conducting an original research project
Skills	
B1	Display mastery of the complex and specialised areas of knowledge and skills related to cardiac rhythm management and electrophysiology
B2	Critically assess conduction system disease processes through advanced technical or professional activity, accepting accountability for related decision making
B3	Debate ethical and legal issues in cardiac rhythm management and electrophysiology
B4	Propose new hypotheses relevant to discipline
B5	Present, analyse and critically evaluate physiological data
B6	Design and develop a research project; present and critically evaluate the research findings
B7	Recognise and respond to moral, ethical and safety issues, which directly pertain to cardiac rhythm management and electrophysiology
B8	Critically assess health risk factors associated with working in a research or clinical setting
B9	Demonstrate effective communication and presentation skills
B10	Demonstrate leadership and managerial skills
B11	Demonstrate competence in the use of information technology
B12	Demonstrate numeracy and problem solving skills at a high level
B13	Reflect on and evaluate own practice

B14	Manage a research project and demonstrate a high level of research skills
B15	Critically evaluate research findings in the context of the literature research

Programme outcomes																							
A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15
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	7	7	7

MSc Cardiac Rhythm Management and Electrophysiology																									
Module Title	Module Code by Level	Programme Outcomes																							
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15
Leadership and Management	BMS4677									x				x				x	x	x	x					
Biomedical Ethics and Law	BMS4777							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
Cardiac Imaging and Diagnostics	BMS4597	x			x	x	x	x					x		x	x				x		x	x			
Cardiac Rhythm Management	BMS4007	x	x	x	x	x	x	x				x	x			x				x		x	x			
Clinical Electrophysiology	BMS4067	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		

PGDip Cardiac Rhythm Management and Electrophysiology																									
Module Title	Module Code by Level	Programme Outcomes																							
		A1	A2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15
Leadership and Management	BMS4677									x			x				x	x	x	x					
Biomedical Ethics and Law	BMS4777							x					x				x								
Experimental Design and Statistics	BMS4887						x		x					X	x	x	x		x		x	x		x	
Cardiac Imaging and Diagnostics	BMS4597	x			x	x	x	x				x		X	x				x		x	x			
Cardiac Rhythm Management	BMS4007	x	x	x	x	x	x	x			x	x			x				x		x	x			
Clinical Electrophysiology	BMS4067	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		

PCert Cardiac Rhythm Management and Electrophysiology										
Module Title	Module Code by Level	Programme Outcomes								
		A1	A2	A3	A4	B1	B2	B3	B4	B5
Cardiac Rhythm Management	BMS4007	x	x	x	x	x	x			x
Clinical Electrophysiology	BMS4067	x	x	x	x	x	x			x
Clinical Practice	BMS4097	x				x	x	x	x	x