

Programme Specification and Curriculum Map for MSc Biomedical Science (Specialism)



1. Programme title	MSc Biomedical Science (Specialism)
2. Awarding institution	Middlesex University
3. Teaching institution	Middlesex University
4. Programme accredited by	The Institute of Biomedical Science
5. Final qualification	MSc/PGDip/PGCert Biomedical Science (Cellular Pathology) MSc/PGDip/PGCert Biomedical Science (Clinical Biochemistry) MSc/PGDip/PGCert Biomedical Science (Haematology and Transfusion Science) MSc/PGDip/PGCert Biomedical Science (Medical Immunology) MSc/PGDip/PGCert Biomedical Science (Medical Microbiology) PGCert Biomedical Science
6. Academic year	2017/2018
7. Language of study	English
8. Mode of study	Full-time and Part-time

9. Criteria for admission to the programme

Candidates must meet at least one of the first two criteria below:

- i. A good honours degree (minimum 2.ii) or equivalent qualification, in an appropriate subject.
- ii. Applicants with other qualifications and / or substantial work experience in biomedical science 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.
- iii. Overseas Candidates should also be competent in English and have achieved, as a minimum, one of the following standards: IELTS-6.5; TOEFL – 84.

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 programmes aim to prepare students for independent research careers in academia, diagnostic laboratories or the biotechnology sector.

The PGCert Biomedical Science aims to:

- Equip students with a mastery of the fundamental principles and recent advances in biomedical science.
- Provide students with sufficiently detailed information about the modern technologies used in diagnostics and research to enable them to apply these to complex problem solving in the investigation of disease

- Enable students to understand and use the principles of laboratory management, safety, quality control, research and statistical methods in their professional lives.
- Enable students to critically evaluate legal requirements for human and animal experiments and ethical issues relating to research with human subjects and human tissue.
- Give students the ability to critically evaluate current research literature in biomedical science, and an acquisition of the skills for lifelong learning
- Allow students to develop mastery of management, leadership and communication skills, teamwork, writing and presentation skills

The PGCert Biomedical Science (Specialism) aims to:

- Equip students with a mastery of the fundamental principles and recent advances in biomedical science within a specific specialism.
- 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, within a specific specialism, to enable them to apply these to complex problem solving in the investigation of disease

The PGDip/MSc Biomedical Science (Specialism) aims to:

- Equip students with a mastery of the fundamental principles and recent advances in biomedical science within a specific specialism.
- Give students a thorough grounding in the fundamental mechanisms underpinning the major pathological processes.
- Provide students with sufficient detailed information about the modern technologies used in diagnostics and research to enable them to apply these to complex problem solving in the investigation of disease.
- Enable students to understand and use the principles of laboratory management, safety, quality control, research and statistical methods in their professional lives.
- Enable students to critically evaluate legal requirements for human and animal 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 biomedical science, and an acquisition of the skills for lifelong learning
- Allow students to develop mastery of management, leadership and communication skills, teamwork, writing and presentation skills.

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

- Have acquired the design, critical analysis and, where possible, the 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 acquired mastery of:

1. The aetiology, pathology and treatment of common diseases

Teaching/learning methods

Students gain knowledge and understanding through online pre-recorded and live lectures, online seminars, laboratory sessions where possible and supplemented by virtual

<ul style="list-style-type: none"> 2. Ethical and legal issues in biomedical science 3. Diagnostic techniques 4. Research methods 5. Leadership skills and laboratory management 	<p>laboratory simulations, and self-study (both directed and self-directed) .</p> <p>Assessment Method Students' knowledge and understanding is assessed by both summative and formative assessments, which include online seminar presentations, written assignments including laboratory reports, seen and unseen theory examinations.</p>
<p>B. Cognitive (thinking) skills On completion of the PGDip or MSc programme the successful student will be able to:</p> <ul style="list-style-type: none"> 1. Develop ideas through the evaluation of appropriate literature, concepts and principles 2. Design a research project 3. Analyse, present, judge, interpret and critically evaluate biomedical data 4. Debate ethical and legal issues in biomedical science 5. Develop a research project 6. Critically assess health risk factors associated with working in a research or diagnostic laboratory <p>In addition, on completion of the MSc the successful student will be able to</p> <ul style="list-style-type: none"> 7. Propose new hypotheses relevant to discipline 8. Critically evaluate their research findings in the context of the literature research 	<p>Teaching/learning methods 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>Assessment Method Students' cognitive skills are assessed by written work, examinations, presentations and a research project.</p>
<p>C. Practical skills On completion of the programme the successful student will be able to:</p> <ul style="list-style-type: none"> 1. Competently perform advanced biomedical laboratory techniques in accordance with health and safety guidelines <p>Ability to fully meet this PLO will be dependent on Covid-19 restrictions in place with regard to lab access. If lab access is restricted, students will be supported to demonstrate knowledge of how to meet this PLO</p> <ul style="list-style-type: none"> 2. Recognise and respond to moral, ethical and safety issues, which directly pertain to biomedical science 3. Correctly perform quality control and assurance procedures 	<p>Teaching/learning methods Where possible students learn practical skills through laboratory practical classes, and undertaking a research project. Virtual laboratory simulations will also be used to develop knowledge of practical skills.</p> <p>Assessment Method Students' knowledge of practical skills are assessed by laboratory reports and dissertation.</p>

<p>Ability to fully meet this PLO will be dependent on Covid-19 restrictions in place with regard to lab access. If lab access is restricted, students will be supported to demonstrate knowledge of how to meet this PLO</p> <p>In addition, on completion of the MSc the successful student will be able to</p> <p>4. Carry out research experiments</p> <p>Ability to fully meet this PLO will be dependent on Covid-19 restrictions in place with regard to lab access. If lab access is restricted, students will be supported to demonstrate knowledge of how to meet this PLO</p>	
<p>D. Professional Skills</p> <p>On completion of this programme the successful student will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate effective communication and presentation skills 2. Demonstrate leadership and managerial skills 3. Demonstrate competence in the use of information technology 4. Demonstrate numeracy and problem-solving skills at a high level 5. Manage a research project and use a range of research skills 	<p>Teaching/learning methods</p> <p>Students acquire graduate skills through lectures, seminars, practical laboratory work where possible and supplemented by virtual online laboratory simulations., literature searches, videos and online presentations, research project</p> <p>Assessment method</p> <p>Students' graduate skills are assessed by online presentations, self-assessment and project work.</p>

<p>12. Programme structure (levels, modules, credits and progression requirements)</p>
<p>12. 1 Overall structure of the programme</p>
<p>All programmes can be studied over either one year full time or two years part time.</p> <p>For a PGCert in Biomedical Science, full-time students will complete the four 15-credits core modules whereas for a PGCert in one of the specialisms, students will take the four 15-credits specialist modules in one year. For both awards, part-time students will normally take two modules in each of the two years.</p> <p>Full-time PGDip and MSc students will take the four core modules and the four specialist modules over an academic year. In addition, the MSc students will take a 60-credits project module during the Summer term. Students cannot start their projects until they have passed all taught modules with the exception of the Medical Immunology pathway. For the Medical Immunology pathway, students will be allowed to start their project in the summer term as long as they have either passed all their taught modules or have failed or deferred no more than one module as long as this is not BMS4887 . As the BMS4887 Experimental Design and Statistics module involves the acquisition of research skills that are vital to running the BMS4977 research</p>

project, all students will still be expected to pass this module prior to starting their research project.

Part-time PGDip and MSc students will take three modules in each of the two years. Only the MSc students will undertake a research project after passing all taught modules.

The total number of credits required for an award is: 60 credits for a PGCert; 120 for the PGDip; and 180 for the MSc.

12.2 Levels and modules		
Level 7 (4)		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
All students must take the following for the PGCert Biomedical Science: BMS4667 BMS4777 BMS4877 BMS4977	None	Not applicable
All students must complete the 4 modules that form one of the specialisms in order to gain the PGCert Biomedical Science (Specialism):	Cellular Pathology BMS4217 BMS4227 BMS4237 BMS4247 Clinical Biochemistry BMS4117 BMS4127 BMS4137 BMS4147 Haematology and Transfusion Science BMS4317 BMS4327 BMS4337 BMS4347 Medical Immunology BMS4517 BMS4527 BMS4537 Medical Microbiology BMS4417 BMS4427 BMS4437 BMS4447	

All students must complete the following for the PGDip and in addition to this must complete the four modules that form one of the specialisms:

BMS4667
BMS4777
BMS4887
BMS4977

For Cellular Pathology:

BMS4217
BMS4227
BMS4237
BMS4247

For Clinical Biochemistry:

BMS4117
BMS4127
BMS4137
BMS4147

For Haematology and Transfusion Science:

BMS4317
BMS4327
BMS4337
BMS4347

For Medical Immunology

BMS4517
BMS4527
BMS4537

For Medical Microbiology:

BMS4417
BMS4427
BMS4437
BMS4447

Successful completion of all modules

<p>All students must complete the following for the MSc and in addition to this must complete the four modules that form one of the specialisms: BMS4667 BMS4777 BMS4887 BMS4977 BMS4997</p>	<p>For Cellular Pathology: BMS4217 BMS4227 BMS4237 BMS4247</p> <p>For Clinical Biochemistry: BMS4117 BMS4127 BMS4137 BMS4147</p> <p>For Haematology and Transfusion Science: BMS4317 BMS4327 BMS4337 BMS4347</p> <p>For Medical Immunology BMS4517 BMS4527 BMS4537</p> <p>For Medical Microbiology: BMS4417 BMS4427 BMS4437 BMS4447</p>	<p>Successful completion of all modules</p>
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12.3 Non-compensable modules	
Module level	Module code
7	All modules

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 specialist practitioner (currently BMS2) to higher specialist practitioner (currently (BMS3).

17. Particular support for learning (if applicable)

Where possible students will have access to specialist laboratory facilities for the development of practical skills. Our new laboratories for research and postgraduate teaching are based at Hendon. These include a molecular biology lab for techniques such as DNA sequencing, real-time PCR, electrophoresis, HPLC, MS, as well as a fully equipped proteomics facility. Knowledge of practical skills will also be developed through carrying out research experiments where possible.

Access to specialist journals will be provided by Middlesex University Library and at the hospital campuses. 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; supervisors there should hold the FIBMS qualification or equivalent, and can access the Laboratory Mentorship programme at Middlesex University to help them support the student.

Applicants with a disability can enter the programme following an assessment of their needs, and where necessary, 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 biomedical science 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.

18. JACS code (or other relevant coding system)	B900
19. Relevant QAA subject benchmark group(s)	Biomedical Science

20. Reference points

The following reference points were used in designing the programme:

Internal Documentation:

- i. Middlesex University (2006) *Learning Framework Document*. London, MU
- ii. Middlesex University (2016) *Middlesex University Regulations*. London, MU
- iii. School of Health and Social Sciences (2008) *Assessment Policy and Strategy*. HSSC

External Documentation:

1. IBMS (2014) *Criteria and Requirements for the Accreditation and Re-accreditation of MSc degrees in Biomedical Science*. London, IBMS
2. Quality Assurance Agency (2008) *Framework for Higher Qualifications*, London, QAA
3. Quality Assurance Agency (2015) *QAA Subject Benchmarking Group: Biomedical Sciences*. London, QAA
4. Department of Health (2009) *The Future of the Healthcare Science Workforce Modernising Scientific Careers: The Next Steps A Consultation*. London, DoH

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 Biomedical Science

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 aetiology, pathology and treatment of common diseases	C1	Competently perform advanced biomedical laboratory techniques in accordance with health and safety guidelines
A2	Ethical and legal issues in biomedical science	C2	Recognise and respond to moral, ethical and safety issues, which directly pertain to the biomedical science
A3	Diagnostic techniques	C3	Correctly perform quality control and assurance procedures
A4	Research methods	C4	Carry out research experiments
A5	Leadership and laboratory 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	Design a research project	D2	Demonstrate leadership and managerial skills
B3	Analyse, present, interpret and critically evaluate biomedical data	D3	Demonstrate competence in the use of information technology
B4	Debate ethical and legal issues in biomedical science	D4	Demonstrate a high level of numeracy and problem solving skills
B5	Develop a research project	D5	Manage a research project and use a range of research skills
B6	Critically assess health risk factors associated with working in a research or diagnostic laboratory		
B7	Propose new hypotheses relevant to discipline		
B8	Critically evaluate research findings in the context of the literature research		

MSc Biomedical Science (Clinical Biochemistry)

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	
Leadership and Management	BMS4677					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	
Advanced Bioanalytical Techniques	BMS4977			X					X			X					X										
Research Project	BMS4997		X		X			X	X		X	X	X	X			X		X		X			X	X		
Clinical Disorders	BMS4117	X		X				X	X																		
Developmental Biochemistry	BMS4127	X		X				X	X													X					
Endocrinology and Metabolism	BMS4137	X		X				X	X																		
Bioanalysis and Clinical Toxicology	BMS4147		X	X					X	X		X					X	X	X					X	X		

MSc Biomedical Science (Medical Immunology)

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				
Leadership and Management	BMS4677					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				
Advanced Bioanalytical Techniques	BMS4977			X						X			X				X					X								
Research Project	BMS4997	X	X		X				X	X		X	X	X	X			X		X		X			X	X				
Immunology	BMS4517	X		X				X		X							X													
Immunopathology	BMS4527	X		X				X		X													X							
Immunotherapeutics and immunoassays	BMS4537	X		X				X		X														X						

MSc Biomedical Science (Medical Microbiology)

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	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		
Leadership and Management	BMS4677					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	
Advanced Bioanalytical Techniques	BMS4977			X					X			X					X								
Research Project	BMS4997		X		X			X	X		X	X	X	X			X		X			X		X	
Infectious Agents	BMS4417	X		X			X		X								X								
Human Infectious Diseases	BMS4427	X		X			X		X												X				
Control of Infectious Disease	BMS4437	X	X				X		X												X				
Laboratory Diagnosis and Safety	BMS4447			X			X		X			X					X	X	X						