MSc Biomedical Science (Specialism)

Programme Specification

1. Programme title	MSc Biomedical Science (Cellular Pathology) MSc Biomedical Science (Clinical Biochemistry) MSc Biomedical Science (Haematology and Transfusion Science) MSc Biomedical Science (Medical Immunology) MSc Biomedical Science (Medical Microbiology)
2. Awarding institution	Middlesex University
3a Teaching institution	Middlesex University / HEN
3b Language of study	English
4a Valid intake dates	Sept
4b Mode of study	Full-time or Part-time
4c Delivery method	☒ On-campus/Blended ☐ Distance Education
5. Professional / Statutory / Regulatory body	Institute of Biomedical Science (IBMS)
6. Apprenticeship Standard	N/A
7. Final qualification(s) available	MSc/PGDip/PGCert: Biomedical Science (Cellular Pathology) Biomedical Science (Clinical Biochemistry) Biomedical Science (Haematology and Transfusion Science) Biomedical Science (Medical Immunology) Biomedical Science (Medical Microbiology) PGCert Biomedical Science
8. Academic year effective from	2022/23

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 Recognition of Previous Learning (RPL) scheme. Past learning or experience will be mapped against existing programme modules within the programme and the mapping will be considered by the Faculty RPL Sub-committee.
iii. Overseas Candidates should also be competent in English and have achieved, as a minimum, one of the following standards: IELTS 6.5 (with minimum 6.0 in all components); 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.
*Appropriate example subjects for all programmes are as follows:
MSc BMS (Medical Immunology): Biomedical Science, Biology with human biology content, Medical Laboratory Science, Clinical Laboratory Science, Medical Laboratory Technology
MSc BMS (Clinical Biochemistry): Biomedical Science, Biochemistry, Medical Laboratory Science
MSc BMS (Cellular Pathology): Biomedical Science, Medical laboratory science, Clinical Laboratory Science, Medical Laboratory Technology
MSc BMS (Medical Microbiology): Biomedical Science, Microbiology and Medical Laboratory Technology/Science
MSc BMS (Haematology and Transfusion Science): Biomedical Science, Medical Laboratory Science, Clinical Laboratory Science, Medicine

10. Aims of the programme

The MSc programmes aim to:

1. Prepare students for independent research careers in academia, diagnostic laboratories, or the life sciences sector.
2. Equip students with a mastery of the fundamental principles and recent advances in biomedical science within a specific specialism.
3. Give students a thorough grounding in the fundamental mechanisms underpinning the major pathological processes.
4. 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.
5. Enable students to understand and use the principles of laboratory management, safety, quality control, research, and statistical methods in their professional lives.
6. Enable students to critically evaluate legal requirements for human and animal experiments and ethical issues relating to research with human subjects and human tissue.
7. Provide students with the tools to acquire the essential facts, concepts, principles, and theories relevant to their chosen research project.
8. Give students the ability to critically evaluate current research literature in biomedical science, and an acquisition of the skills for lifelong learning.

9. Allow students to develop mastery of managing change and communication skills, teamwork, writing and presentation skills.

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

10. Have acquired the design, critical analysis, and practical skills necessary to carry out an individualised experimental research project.
11. 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:

A1. The aetiology, pathology, and treatment of common diseases
A2. Ethical issues in biomedical science
A3. Diagnostic and bioanalytical techniques
A4. Research methods
A5. Leadership theories and laboratory management

Teaching/learning methods

Students gain knowledge and understanding through lectures, seminars and laboratory work, self-study (both directed and self-directed) and online learning.

Assessment Method

Students' knowledge and understanding is assessed by both summative and formative assessments, which include seminar presentations, written assignments, including case-studies and laboratory reports.

B. Skills

On completion of the MSc programme the successful student will be able to:

B1. Develop ideas through the evaluation of appropriate literature, concepts, and principles
B2. Analyse, present, interpret and critically evaluate biomedical data
B3. Develop a research project
B4. Competently perform advanced biomedical laboratory techniques in accordance with health and safety guidelines

In addition, on completion of the MSc project, the successful student will be able to:
B5. Propose new hypotheses relevant to discipline
B6. Critically evaluate their research findings in the context of the literature research
B7. Carry out research experiments

Teaching/learning methods

Students learn 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.

Assessment Method
Students' skills are assessed by written assignments, presentations, and research project. Students' practical skills are assessed by laboratory reports and dissertation.

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

12. 1 Overall structure of the programme

Full-time

Autumn Term (Oct)
- BMS4887 Experimental Design and Statistics (15 credits)
- BMS4977 Advanced Bioanalytical Techniques (15 credits)
- BMS4217 Major Organ Histopathology (15 credits)
- BMS4247 Pathological Basis of Diseases (15 credits)
- BMS4117 Clinical Disorders (15 credits)
- BMS4127 Developmental Biochemistry (15 credits)
- BMS4317 Blood Analysis and Pathology (15 credits)
- BMS4327 Haemato-oncology (15 credits)
- BMS4517 Immunology (30 credits)
- BMS4417 Infectious Agents (15 credits)
- BMS4447 Laboratory Diagnosis and Safety (15 credits)

Winter Term (Jan)
- BMS4477 Bioethics (15 credits)
- BMS4677 Leadership and Management (15 credits)
- BMS4237 Genetic Disorders (15 credits)
- BMS4227 Cancer (15 credits)
- BMS41737 Endocrinology and Metabolism (15 credits)
- BMS4147 Bioanalysis and Clinical Toxicology (15 credits)
- BMS4337 Haemostasis (15 credits)
- BMS4347 Transfusion Science (15 credits)
- BMS4527 Immunopathology (15 credits)
- BMS4537 Immunotherapeutics and Immunoassays (15 credits)
- BMS4427 Human Infectious Disease (15 credits)
- BMS4437 Control of Infectious Disease (15 credits)

Summer Term (June-Sept)
- BMS4997 Research Project (60 credits)

Part-time

Year One
Autumn Term (Oct)
- BMS4217 Major Organ Histopathology (15 credits)

- BMS4247 Pathological Basis of Diseases (15 credits)
- BMS4117 Clinical Disorders (15 credits)
- BMS4127 Developmental Biochemistry (15 credits)
- BMS4317 Blood Analysis and Pathology (15 credits)
- BMS4327 Haemato-oncology (15 credits)
- BMS4517 Immunology (30 credits)
- BMS4417 Infectious Agents (15 credits)
- BMS4447 Laboratory Diagnosis and Safety (15 credits)

Winter Term (Jan)
- BMS4237 Genetic Disorders (15 credits)
- BMS4227 Cancer (15 credits)
- BMS41737 Endocrinology and Metabolism (15 credits)
- BMS4147 Bioanalysis and Clinical Toxicology (15 credits)
- BMS4337 Haemostasis (15 credits)
- BMS4347 Transfusion Science (15 credits)
- BMS4527 Immunopathology (15 credits)
- BMS4537 Immunotherapeutics and Immunoassays (15 credits)
- BMS4427 Human Infectious Disease (15 credits)
- BMS4437 Control of Infectious Disease (15 credits)

Year Two

Autumn Term (Oct)
- BMS4887 Experimental Design and Statistics (15 credits)
- BMS4977 Advanced Bioanalytical Techniques (15 credits)

Winter Term (Jan)
- BMS4477 Bioethics (15 credits)
- BMS4677 Leadership and Management (15 credits)

Summer Term (June-Sept)
- BMS4997 Research Project (60 credits)

Successful completion of all modules (180 credits) will result in the full award of MSc Biomedical Science (with specialism). Completion of all specialist taught modules only (60 credits) will lead to the award of PGCert Biomedical Science (with specialism). Completion of the core taught modules only (60 credits) will lead to the award of PGCert Biomedical Science. Completion of all core and specialist taught modules, but non-completion of the 60-credit dissertation module will lead to the award of PGDip Biomedical Science (with specialism).

12.2 Levels and modules

Level 7

Compulsory

For the MSc, students must take all the following:

- BMS4477 Bioethics
- BMS4677 Leadership and Management
- BMS4887 Experimental Design and Statistics
- BMS4977 Advanced Bioanalytical Techniques
- BMS4997 Research Project

Optional
Students must also choose one of the following specialisms:

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

Progression requirements
To progress onto the project/MSc stage, students must pass 105 credits, including BMS4887.

12.3 Non-compensatable modules

Module level - Level 7

Module code - Cellular Pathology: BMS4217, BMS4227, BMS4237 and 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
Core: BMS4887, BMS4997

13. Information about assessment regulations

This programme will run in line with general University Regulations.

14. Placement opportunities, requirements and support

Not applicable

15. Future careers / progression

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 to Higher Specialist Practitioner.

16. Particular support for learning (if applicable)

We have specialist laboratory facilities for the development of practical skills. Our 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, Tissue Culture facility, Accuri C6 flow cytometer as well as a fully equipped proteomics facility. Access to specialist journals will be provided by Middlesex University Library. 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.

Applicants with a disability can enter the programme following an assessment of their needs 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. This will be administered by the Dyslexia and Disability Service in conjunction with the programme leader. 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.

17. HECos code(s) - CAH02-03-10

18. Relevant QAA subject benchmark(s) - Biomedical Sciences

19. Reference points

The following reference points were used in designing the programme.

Internal Documentation:
Middlesex University (2021) Middlesex University Regulations. London, MU

External Documentation:

1. IBMS (2020) Criteria and Requirements for the Accreditation and Re-accreditation of MSc degrees. IBMS.
2. Quality Assurance Agency (2020) QAA Master's Degree Characteristics. London, QAA

20. Other Comments

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.

21. Curriculum map for MSc Biomedical Science (Specialism)

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, pathology and treatment of common diseases
A2	Ethical issues in biomedical science
A3	Diagnostic and bioanalytical techniques
A4	Research methods
A5	Leadership theories and laboratory management

Skills:

B1	Develop ideas through the evaluation of appropriate literature, concepts, theories and principles
B2	Analyse, present, interpret and critically evaluate biomedical data
B3	Develop a research project
B4	Competently perform advanced biomedical laboratory techniques in accordance with health and safety guidelines
B5	Propose new hypotheses relevant to discipline
B6	Critically evaluate their research findings in the context of published literature
B7	Carry out research experiments

Programme Outcomes:

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7

Highest level achieved by all graduates

7	7	7	7	7	7	7	7	7	7	7	7

MSc Biomedical Science (Cellular Pathology)

Programme Outcomes:

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7

Highest level achieved by all graduates

7	7	7	7	7	7	7	7	7	7	7	7

Module Title	**Module Code by Level**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**
Leadership and Management	BMS4677					x	x						
Bioethics	BMS4477		x				x						
Experimental Design and Statistics	BMS4887				x			x	x				
Advanced Bioanalytical Techniques	BMS4977			x				x		x			
Research Project	BMS4997		x		x			x	x		x	x	x
Major Organ Histopathology	BMS4217	x		x			x	x					
Cancer	BMS4227	x		x			x	x					
Genetic Disorders	BMS4237	x	x	x			x	x					
Pathological Basis of Diseases	BMS4247	x		x				x					

MSc Biomedical Science (Clinical Biochemistry)

Programme Outcomes:

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7

Highest level achieved by all graduates

7	7	7	7	7	7	7	7	7	7	7	7

Module Title	Module Code by Level	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7
Leadership and Management	BMS4677					x	x						
Bioethics	BMS4477		x				x						
Experimental Design and Statistics	BMS4887				x			x	x				
Advanced Bioanalytical Techniques	BMS4977			x				x		x			
Research Project	BMS4997		x		x			x	x		x	x	x
Clinical Disorders	BMS4117	x		x			x	x					
Developmental Biochemistry	BMS4127	x		x			x	x					
Endocrinology and Metabolism	BMS4137	x		x			x	x					
Bioanalysis and Clinical Toxicology	BMS4147		x	x				x		x			

MSc Biomedical Science (Haematology and Transfusion Science)

Programme Outcomes:

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7

Highest level achieved by all graduates

7	7	7	7	7	7	7	7	7	7	7	7

Module Title	**Module Code by Level**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**
Leadership and Management	BMS4677					x	x						
Bioethics	BMS4477		x				x	x					
Experimental Design and Statistics	BMS4887				x			x	x				
Advanced Bioanalytical Techniques	BMS4977			x				x		x			
Research Project	BMS4997		x		x			x	x		x	x	x
Blood Analysis and Pathology	BMS4317	x		x			x	x		x			
Haemato-oncology	BMS4327	x		x			x	x					
Haemostasis	BMS4337	x		x			x	x					
Transfusion Science	BMS4347	x	x	x			x						

MSc Biomedical Science (Medical Immunology)

Programme Outcomes:

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7

Highest level achieved by all graduates

7	7	7	7	7	7	7	7	7	7	7	7

Module Title	**Module Code by Level**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**
Leadership and Management	BMS4677					x	x						
Bioethics	BMS4477		x				x						
Experimental Design and Statistics	BMS4887				x			x	x				
Advanced Bioanalytical Techniques	BMS4977			x				x		x			
Research Project	BMS4997	x	x		x			x	x		x	x	x
Immunology	BMS4517	x		x			x	x		x			
Immunopathology	BMS4527	x		x			x	x					
Immunotherapeutics and immunoassays	BMS4537	x		x			x	x					

MSc Biomedical Science (Medical Microbiology)

Programme Outcomes:

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7

Highest level achieved by all graduates

7	7	7	7	7	7	7	7	7	7	7	7

Module Title	**Module Code by Level**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**
Leadership and Management	BMS4677					x	x						
Bioethics	BMS4477		x				x						
Experimental Design and Statistics	BMS4887				x			x	x				
Advanced Bioanalytical Techniques	BMS4977			x				x		x			
Research Project	BMS4997		x		x			x	x		x	x	x
Infectious Agents	BMS4417	x		x			x	x		x			
Human Infectious Diseases	BMS4427	x		x			x	x					
Control of Infectious Disease	BMS4437	x	x				x	x					
Laboratory Diagnosis and Safety	BMS4447			x			x	x		x			