MSc Drug Design and Discovery

Programme Specification

1. Programme title	MSc Drug Design and Discovery
2. Awarding institution	Middlesex University
3a Teaching institution	Middlesex University (Hendon and Dubai)
3b Language of study	English
4a Valid intake dates	MSc Drug Design and Discovery September intake
4b Mode of study	Full-time or Part-time
4c Delivery method	☒ On-campus/Blended ☐ Distance Education
5. Professional / Statutory / Regulatory body	N/A
6. Apprenticeship Standard	N/A
7. Final qualification(s) available	PGDip Drug Design and Discovery PGCert Drug Design and Discovery
8. Academic year effective from	2023

9. Criteria for admission to the programme

A second-class honours degree 2.2 or higher in a related science subject such as pharmacy, pharmaceutical science, pharmacology, chemistry, biochemistry, biotechnology, biomedical science, biology.

Overseas candidates, whose first language is not English, will need a qualification that demonstrates competence in English language IELTS 6.5 (with minimum 6.0 in all components) or an equivalent English qualification.

10. Aims of the programme

The programme aims to:
- To provide students with a comprehensive understanding of the drug design and discovery process from target identification to development and regulatory affairs
- To provide students with hands on experience on computer-aided drug design

- To provide students with hands on experience with analytical and/or synthetic techniques
- To develop the student's ability to apply scientific methods and approaches to research, product development and innovation
- To prepare students for employment in the pharmaceutical and healthcare industries

11. Programme outcomes*

A. Knowledge and understanding
On completion of this programme the successful student will have knowledge and understanding of:
1. The principles of the drug discovery process including target identification, drug design, delivery and development
2. Advanced topics in drug discovery including nanotechnology and/or cheminformatics
3. An overview of the ethical and legal approaches in biomedical research and regulatory affairs in drug discovery
4. Advanced analytical or synthetic techniques used in diagnostic and/or pharmaceutical research
5. Ethical and societal responsibilities in pharmaceutical research
6. The structure and management of a business organisation

Teaching/learning methods
Students gain knowledge and understanding through on-campus or online lectures, seminars, computational workshops, laboratory classes, peer presentations, debates, designing and undertaking a research project.

Assessment methods
Students' knowledge and understanding are assessed by summative and formative assessment, including oral/video presentations, laboratory reports, essays, online quizzes, in-class tests and unseen theory examinations.

B. Skills
On completion of this programme the successful student will be able to:
1. Develop ideas through the evaluation of appropriate research evidence, scientific concepts or principles
2. Present, analyse and critically evaluate scientific information and data
3. Perform analytical and/or synthetic laboratory techniques competently, and in accordance with health and safety guidelines
4. Demonstrate a high level of research and problem-solving skills
5. Demonstrate creativity, innovation or business acumen

Teaching/learning methods
Students learn cognitive skills through lectures, seminars, discussions, peer presentations, a research project, debates and problem-solving exercises.
Students learn practical skills through laboratory practical and computational classes and undertaking a research project.

Assessment methods

Students' skills are assessed by a variety of formative and summative assessment methods including written work such as, essays, lab reports, examinations and oral assessments such as, presentations.

12. Programme structure (levels, modules, credits and progression requirements)
12. 1 Overall structure of the programme

MSc Drug Design and Discovery – Full time

Year 1 – Core modules

Term 1 (Oct)
- BMS4757 Current Trends in Drug Design and Discovery (15 credits)
- BMS4747 Cheminformatics (15 credits)
- BMS4887 Experimental Design and Statistics (15 credits)

Term 2 (Jan)
- BMS4477 Bioethics (15 credits)
- BMS4677 Leadership and Management (15 credits)

Year 1 – Optional modules (choose one optional module in term 1 AND two optional modules in term 2)

Term 1 (Oct)
- BMS4977 Advanced Bioanalytical Techniques (15 credits)
- BMS4737 Nanotechnology (15 credits)

Term 2 (Jan)
- BMS4537 Immunotherapeutics and immunoassays (15 credits)
- BMS4727 Advanced Organic Synthesis Techniques (15 credits)
- BMS4787 Intellectual Property and the Generics Industry (15 credits)

Term 3 (June)
- BMS4997 Research Project (60 credits)

MSc Drug Design and Discovery – Part time

Year 1 – Core modules

Term 1 (Oct)
- BMS4757 Current Trends in Drug Design and Discovery (15 credits)
- BMS4747 Cheminformatics (15 credits)

Term 2 (Jan)
- BMS4677 Leadership and Management (15 credits)

Year 1 – Optional modules (choose one optional module in term 1 AND one optional module in term 2)

Term 1 (Oct)
- BMS4977 Advanced Bioanalytical Techniques (15 credits)
- BMS4737 Nanotechnology (15 credits)

Term 2 (Jan)
- BMS4537 Immunotherapeutics and immunoassays (15 credits)
- BMS4727 Advanced Organic Synthesis Techniques (15 credits)
- BMS4787 Intellectual Property and the Generics Industry (15 credits)

Year 2 – Core modules

Term 1 (Oct)
- BMS4887 Experimental Design and Statistics (15 credits)

Term 2 (Jan)
- BMS4477 Bioethics (15 credits)

Year 2 – Optional modules (choose one optional module in term 1 OR one optional module in term 2)

Term 1 (Oct)
- BMS4977 Advanced Bioanalytical Techniques (15 credits)
- BMS4737 Nanotechnology (15 credits)

Term 2 (Jan)
- BMS4537 Immunotherapeutics and immunoassays (15 credits)
- BMS4727 Advanced Organic Synthesis Techniques (15 credits)
- BMS4787 Intellectual Property and the Generics Industry (15 credits)

Term 3 (June)
- BMS4997 Research Project (60 credits)

For a PGCert in Drug Design and Discovery, students will complete the four out of the five 15-credits core modules which must include the two specialist modules BMS4757 Current Trends in Drug Design and Discovery and BMS4747 Cheminformatics and any two of the other three core modules.

PGDip students will complete all five 15-credit core modules and the three of the optional modules.

12.2 Levels and modules

<u>Level 7</u>
Compulsory
Students must take all of the following:
- BMS4757
- BMS4747
- BMS4887
- BMS4477

- BMS4677
- BMS4997

Optional
Students must choose three from the following:
- BMS4977
- BMS4727
- BMS4537
- BMS4737
- BMS4787

Progression requirements
All modules must be passed

12.3 Non-compensatable modules
All modules are non-compensatable

13. Information about assessment regulations
This programme will run in line with general University Regulations:

(https://www.mdx.ac.uk/__data/assets/pdf_file/0031/623758/Regulations-2021-22-V1.12.pdf)

Normally all modules must be passed either by assessment or pre-accreditation. To pass a module with multiple assessments, students must achieve an aggregate grade of at least 16 with a minimum of grade 16 for each component.

Formative assessments prepare students for their summative assessments. It is therefore recommended that students should engage with all forms of assessments.

14. Placement opportunities, requirements and support (if applicable)
Not applicable

15. Future careers / progression
The MSc Drug Design and Discovery provides a broad overview of the drug discovery and development process and is designed for graduates in science-based subjects as preparation for either PhD-level research or a career in the pharmaceutical industry. Potential employers include pharmaceutical companies such as GlaxoSmithKline, Eli Lilly, Astrazeneca, as well as small biotechnology companies and contract research firms. Students can also choose non-laboratory careers such as, with a government regulatory body, science education, project management, intellectual property (patent law).

16. Particular support for learning (if applicable)
Specialist laboratory facilities, online resources and learning resource facilities are available to help learn and develop skills. Additionally, student support, such as English language, learning Support, and dyslexic and disability support, are also available. See: https://www.mdx.ac.uk/student-life/student-support

17. HECos code(s) - 100420 (Medicinal Chemistry)

18. Relevant QAA subject benchmark(s) - Medicinal Chemistry

19. Reference points
Internal documentation:
Middlesex University (2006) *Learning Framework Document.* MU.
Middlesex University (2020) *Middlesex University Regulations.* MU.
Middlesex University (2020) *LQE Handbook.* MU.

External documentation:
QAA (2019) *Chemistry*. QAA.

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.

21. Curriculum map for MSc Drug Design and Discovery

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 principles of the drug discovery process including target identification, drug design, delivery and development
A2	Advanced topics in drug discovery including nanotechnology and/or cheminformatics
A3	An overview of the ethical and legal approaches in biomedical research and regulatory affairs in drug discovery
A4	Advanced analytical or synthetic techniques used in diagnostic and/or pharmaceutical research
A5	Ethical and societal responsibilities in pharmaceutical research
A6	The structure and management of a business organisation

Skills:

B1	Develop ideas through the evaluation of appropriate research evidence, scientific concepts or principles
B2	Present, analyse and critically evaluate scientific information and data
B3	Perform analytical and/or synthetic laboratory techniques competently, and in accordance with health and safety guidelines
B4	Demonstrate a high level of research and problem-solving skills
B5	Demonstrate creativity, innovation or business acumen

Programme Outcomes:

A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5

Highest level achieved by all graduates

A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5
7	7	7	7	7	7	7	7	7	7	7

Module Title	Module Code by Level	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5
Current Trends in Drug Design and Discovery	BMS4757	X	X			X		X	X			
Cheminformatics	BMS4747	X	X					X	X		X	X
Experimental Design and Statistics	BMS4887								X			
Bioethics	BMS4477			X		X						
Leadership and Management	BMS4677						X					X
Advanced Bioanalytical Techniques	BMS4977				X				X	X		X
Advanced Organic Synthesis Techniques	BMS4727				X				X	X		X
Immunotherapeutics and Immunoassays	BMS4537	X			X				X	X		
Nanotechnology	BMS4737	X	X			X			X			
Intellectual Property and the Generics Industry	BMS4787	X		X		X						X
Research Project	BMS4997							X	X	X	X	X