

BSc Biochemistry

Programme Specification

1. Programme title	BSc (Hons) Biochemistry BSc (Hons) Biochemistry with Foundation Year
2. Awarding institution	Middlesex University
3a. Teaching institution	Middlesex University (Hendon Campus)
3b. Language of study	English
4a. Valid intake dates	<i>September</i>
4b. Mode of study	<i>FT/PT/TKSW</i>
4c. Delivery method	<input checked="" type="checkbox"/> On-campus/Blended <input type="checkbox"/> Distance Education
5. Professional/Statutory/Regulatory body	n/a
6. Apprenticeship Standard	n/a
7. Final qualification(s) available	BSc (Hons) Biochemistry BSc (Hons) Medical Biochemistry BSc (Hons) Biochemistry with Foundation Year BSc (Hons) Medical Biochemistry with Foundation Year BSc Biochemistry BSc Medical Biochemistry DipHE Biochemistry CertHE Biological Sciences Diploma in Industrial Studies Diploma in Employability Studies
8. Academic year effective from	2024-25

9. Criteria for admission to the programme

5 GCSEs (Grade 4 or above) including English Language, Mathematics

And one of the following:

1. A2 – 112 UCAS points including Biology or Chemistry at grade C or better as well as a second science related subject.
2. QCF Extended Diploma in Applied Science at DMM/ D* D*
3. HNC/HND Applied Biology. HNC Students may be eligible to enter year 2 with a Level 5 pass.
4. ACCESS to science course in relevant science subject (biology, chemistry, physics, science pathway) with a minimum of a pass mark. Should include significant amount of biology and chemistry.
5. Mature student's applications will be reviewed by the programme leader to assess suitability for study at level 4 and might require an interview to discuss this.
6. Students who do not have the standard entry qualifications but who have relevant professional experience may apply to enter the programme using APEL (accreditation of prior experiential learning) – discuss your application with the programme leader.
7. Entry to year 2 or year 3 of the programme – students are welcome to apply with appropriate prior qualifications.

Overseas students are required to demonstrate competence in English e.g. TOEFL of 550 or IELTS 6.0 with a minimum of 5.5 in each component.

Please refer to the programme specification for the Foundation Year for criteria for admission to the [BSc \(Hons\) Biochemistry with Foundation Year](#) programme.

The programme is open to students with disabilities. Students who have a disability are welcome to contact the programme leader prior to applications to discuss any specific needs.

10. Aims of the programme

The programme aims to:

- develop critical awareness of science fostering an interest in the ever-changing nature of knowledge, significance of new developments within the field of biochemistry and subsequent impact on society;
- introduce students to the cross disciplinary nature of biochemistry and its applications in research and industry;
- develop competence in scientific methods of enquiry and problem solving and communication of scientific principles and data through diverse methods;
- provide hands-on experience of state-of-the-art equipment and laboratories for developing practical and analytical skills relevant to biochemistry and appropriate for employment;
- produce graduates able to carry out research within an ethical framework; and
- prepare students for work at postgraduate level and/or for employment in relevant fields.

11. Programme outcomes*

A. Knowledge and understanding

On completion of this programme the successful student will have knowledge and understanding of:

1. Underpinning scientific principles from the fields of biology and chemistry.
2. Biological concepts, from molecular interactions to cellular processes to whole organism.
3. Chemical concepts, from the building blocks of matter to inorganic and organic substances to reactions.
4. Biochemical concepts including metabolism, molecular biology, immunology, bioinformatics and biochemistry in human health and disease.
5. Applications of biochemistry to industry, health and the environment.
6. Analytical techniques and technologies and their applications in research and technology.
7. Environmental impact, ethical responsibilities and local and global sustainability goals in relation to the field of biochemistry and wider society.

Teaching/learning methods

Students gain knowledge and understanding through attendance and participation in seminars, workshops, laboratory classes, online learning activities, excursions and group work. Blended learning is utilised in modules integrating taught, self-directed and e-learning. Critical discussion during practical and seminar work forms an important vehicle for learning.

Participating in different formats of formative assessment such as online learning exercises, peer evaluation, in-class worksheets and group activities and feedback of sample work will also advance knowledge. Short videos will introduce students to underpinning knowledge and threshold concepts.

Assessment methods

Students' knowledge and understanding is assessed by seen and unseen examinations, laboratory work reports, portfolios, essays, case studies, and oral and poster presentations.

B. Skills

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

1. Critically evaluate information collated by laboratory experiments, from literature, informatics methods or online sources and apply information technology to review and evaluate evidence. (1, 4, 8)
2. Work effectively in the laboratory, apply good laboratory practice and competently operate equipment. (2, 4, 8)
3. Effectively communicate through a range of methods. (6)
4. Design research projects; collect, analyse, present, interpret and critically evaluate data. (1, 2, 5, 7)
5. Recognise and consider ethical problems associated with biochemistry research and applications. (6)
6. Develop as a reflective and independent learner to work effectively individually and in interdisciplinary teams. (1, 3)
7. Operate successfully in a culturally diverse and globally oriented society. (3, 5, 7)

Teaching/learning methods

Students learn skills through participation in seminars, workshops, group discussions, peer review of oral presentations and written documents, problem solving exercises and engaging in assessment activities. Students learn practical skills through participation in laboratory classes, virtual labs and video demonstrations and project work for the dissertation. Graduate skills are taught and embedded throughout the programme. Students are introduced to skills in BIO1120 Skills for Scientists and these skills are utilised and developed within modules at each level. Students learn graduate skills through participation in the programme, group work, practical exercises and engagement with e-learning. Emphasis is placed on ICT and numeracy skills in particular. Career tutorials and employability workshops with our network of employers and external speakers will support students to enhance their personal and career development.

Assessment methods

Students' skills are assessed by problem solving exercises and case studies, laboratory reports and portfolios, proposals and a dissertation. Practical skills are assessed by presentation and laboratory practical exams.

The above learning, teaching and assessment will be designed to develop and assess these graduate competencies:

1. Curiosity and learning,
2. collaborative innovation,
3. resilience and adaptability,
4. technological agility,
5. entrepreneurship,
6. communication, empathy, and inclusion,
7. leadership and influence,
8. problem solving and delivery.

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

12.1 Structure of the programme

An undergraduate BSc honours degree is comprised of 360 credits of learning. In each year a student will take 120 credits of learning, and this will enable them to complete the award as a full-time student in 3 years. Part-time students normally undertake 60-90 credits of learning per year and so will complete their study in 4-6 years.

The learning units are comprised of 30 credit modules. In the first, year students will undertake a core programme of study of 120 credits. In subsequent years they will have some core and some optional modules. Each module will be studied in one semester of 10-12 learning weeks followed by an assessment period. Students will be studying two modules in the Autumn Semester and two modules in the Winter/Spring Semester.

Not all optional modules or combinations might be available each year. Optional modules with fewer than 5 students will not run.

Please refer to the programme specification for the Foundation Year for the modules to be taken during the foundation year of the BSc (Hons) Biochemistry with Foundation Year programme: <https://www.mdx.ac.uk/courses/undergraduate/foundation-year-in-science>

Full Time mode

BSc Biochemistry – Year 1

Semester 1

- Fundamentals of Biochemistry BIO1609 (30c)
- Skills for Scientists BIO1120 (30c)

Semester 2

- Cell Sciences and Genetics BIO1557 (30c)
- Form and Function BIO1640 (30c)

Year 2

Semester 1

- Functional Biochemistry BIO2401 (30c)
- Molecular Biology and Gene Control BIO2557 (30c)

Semester 2

- Research Methods and Science Innovation CHE2105 (30c)
- Applied Microbiology and Immunology BIO2632 (30c) – optional
- Analytical and Organic Chemistry CHE2325 (30c) – optional

Sandwich Year in Industry or Research BIO3003 (120c) – optional

Year 3

Semester 1

- Applied Biochemistry BIO3420 (30c)
- Work Experience BIO3799 (30c)
- Biotechnology (30c)

Semester 2

- Dissertation BIO3888 (30c)
- Informatics for Bioscientists BIO3111 (30c)

BSc Medical Biochemistry

Year 1

Semester 1

- Fundamentals of Biochemistry BIO1609 (30c)
- Skills for Scientists BIO1120 (30c)

Semester 2

- Cell Sciences and Genetics BIO1557 (30c)
- Form and Function BIO1640 (30c)

Year 2

Semester 1

- Functional Biochemistry BIO2401 (30c)
- Molecular Biology and Gene Control BIO2557 (30c)

Semester 2

- Research Methods and Science Innovation CHE2105 (30c)
- Biochemical Methods in Cancer Research BIO2412 (30c)

Sandwich Year in Industry or Research BIO3003 (120c) - optional

Year 3

Semester 1

- Applied Biochemistry BIO3420 (30c)
- Work Experience BIO3799 (30c) – optional
- Pharmacology and Toxicology BMS3311 (30c) - optional
- Clinical Nutrition BMS3466 (30c) – optional

Semester 2

- Dissertation BIO3888 (30c)
- Medical and Pharmaceutical Bioanalytical Techniques CHE3786 (30c) - optional
- Clinical Diagnostics BMS3314 (30c) - optional

Part-Time mode

BSc Biochemistry

Year 1

Semester 1

- Skills for Scientists BIO1120 (30c)

Semester 2

- Cell Sciences and Genetics BIO1557 (30c)

Year 2

Semester 1

- Fundamentals of Biochemistry BIO1609 (30c)

Semester 2

- Form and Function BIO1640 (30c)

Year 3

Semester 1

- Functional Biochemistry BIO2401 (30c)

Semester 2

- Research Methods and Science Innovation CHE2105 (30c)

Year 4

Semester 1

- Molecular Biology and Gene Control BIO2557 (30c)

Semester 2

- Applied Microbiology and Immunology BIO2632 (30c) – optional
- Analytical and Organic Chemistry CHE2325 (30c) – optional

Sandwich Year in Industry or Research BIO3003 (120c)

Year 5

Semester 1

- Applied Biochemistry BIO3420 (30c)

Semester 2

- Dissertation BIO3888 (30c)

Year 6

Semester 1

- Work Experience BIO3799 (30c) - optional
- Biotechnology (30c) - optional
- Conservation, restoration and reconciliation BIO3804 (30c)

Semester 2

- Informatics for Bioscientists BIO3111 (30c)

BSc Medical Biochemistry

Year 1

Semester 1

- Skills for Scientists BIO1120 (30c)

Semester 2

- Cell Sciences and Genetics BIO1557 (30c)

Year 2

Semester 1

- Fundamentals of Biochemistry BIO1609 (30c)

Semester 2

- Form and Function BIO1640 (30c)

Year 3

Semester 1

- Functional Biochemistry BIO2401 (30c)

Semester 2

- Research Methods and Science Innovation CHE2105 (30c)

Year 4

Semester 1

- Molecular Biology and Gene Control BIO2557 (30c)

Semester 2

- Biochemical Methods in Cancer Research BIO2412 (30c)

Sandwich Year in Industry or Research BIO3003 (120c) – optional

Year 5

Semester 1

- Applied Biochemistry BIO3420 (30c)

Semester 2

- Dissertation BIO3888 (30c)

Year 6

Semester 1

- Work Experience BIO3799 (30c) – optional
- Pharmacology and Toxicology BMS3311 (30c) - optional
- Clinical Nutrition BMS3466 (30c) – optional

Semester 2

- Medical and Pharmaceutical Bioanalytical Techniques CHE3786 (30c) - optional
- Clinical Diagnostics BMS3314 (30c) - optional

12.2 Levels and modules

Level 4

Compulsory

Students must take all of the following:

- BIO1120 and
- BIO1557 and
- BIO1609 and
- BIO1640

Optional

Progression requirements

Successful students who have passed 120 credits can progress to level 5.

Students with credit deficit may be able to progress trailing some credits or may be required to repeat modules or pass outstanding assessment before they can progress, depending on the number of credits and module(s) concerned. Module BIO1609 must be passed or compensated.

Level 5

Compulsory

Students must take all of the following:

- BIO2401 and
- BIO2557 and
- CHE2105

Optional

Students wanting to study towards the BSc Medical Biochemistry award must choose:

- BIO2412

For the BSc Biochemistry award students must choose one of the following:

- BIO2632 or
- CHE2325

Progression requirements

Successful students who have passed 120 credits can progress to level 6.

Students with credit deficit may be able to progress trailing some credits or may be required to repeat modules or pass outstanding assessment before they can progress, depending on the number of credits and module(s) concerned.

Students studying for the BSc Medical Biochemistry award must achieve a minimum grade of 40% in the specialist module BIO2412 to remain on this pathway.

Students can take the Sandwich Year in Industry or Research module (BIO3003) between year 2 and year 3, but should have a minimum of 120 credits awarded at 50% or above before they take such a year.

Level 6

Compulsory

Students must take all of the following:

- BIO3420 and
- BIO3888

For BSc Biochemistry award also:

- BIO3111

Optional

Students studying for the BSc Biochemistry award must choose one optional module in Semester 1 of the following:

- BIO3215 or
- BIO3804 or
- BIO3799

For the BSc Medical Biochemistry award students must choose one optional module in Semester 1 and one in Semester 2 of the following:

- BIO3799 or
- BMS3311 or
- BMS3446

and

- CHE3786 or
- BMS3314

Progression requirements

Students who have gained a total of 360 credits with 120 credits each at levels 5 and 6 will be awarded the honours degree.

To graduate with a named specialisation, students need to do their dissertation within the specialist field. The topic of the dissertation needs to be ratified by the Programme Leader.

*Please refer to your programme page on the website re availability of option modules

12.3 Non-compensatable modules	
Module level	Module code
Level 4	<i>None</i>
Level 5	BIO2401 BIO2412 for BSc Medical Biochemistry award only
Level 6	BIO3003 for the Diploma award BIO3420, BIO3888 CHE3786/BMS3314 for BSc Medical Biochemistry award only

13. Information about assessment regulations
This programme will run in line with general University Regulations. https://www.mdx.ac.uk/_data/assets/pdf_file/0034/759256/FINAL-Regulations-2023-24.pdf

14. Placement opportunities, requirements and support (if applicable)
<p>There are two opportunities to gain relevant work experience. Students may take a one-year long placement of 120 credits or a 30-credit work experience module. Both provide excellent opportunities to gain employability skills, transferable skills and experience of working in science. This may be in an industrial, research laboratory or hospital-based environment for example. Students will also be supported to find and secure internships and work experiences that they can do outside the scheduled programme, e.g. over the summer between year 2 and 3.</p> <p>The 30 credit (BIO3799) Work Experience module is available as optional module in year 3. Students will be supported by the Programme Team and University Employability Team in the process of preparing for and securing a placement. The module enables work of about 120-160 h, usually as a minimum of 15 workdays in a relevant organisation.</p> <p>The Thick Sandwich Year with a 120-credit placement (BIO3003) can be taken by students who have successfully completed year 2. There are no University fees for the placement year. Students will be supported by the Programme Team and University Employability Team in the process of preparing for and securing a placement. Students will be visited in their placement at least twice and supported by an in-placement mentor, the placement office and a member of the programme team. Both mentor and student will have a guide handbook to explain the requirements and students will keep an ongoing reflective diary of their experiences and also produce a critical appraisal of the organisation they work in. Students who successfully complete the 120-credit placement module will be awarded a Diploma in Industrial Studies or Diploma in Employability Studies, depending on the nature of the placement.</p>

15. Future careers / progression

Skills and knowledge development through the programme coupled with the acquisition of analytical and critical appraisal skills enables graduates to enter a wide range of careers and further study programmes. Successful graduates from this programme are well qualified and may progress to postgraduate study in a related discipline or to a research studentship. Graduates could be employed in hospital, university, or private laboratories; pharmaceutical or chemical industry; forensic or public health facilities; the veterinary or agriculture sector. Graduates will be in a strong position to pursue careers in science teaching (Biology/Chemistry) in secondary schools or colleges as well as other careers in education. Employment may be sought on graduate training programmes, in laboratory or technical work, sales, marketing or technical support for biochemical products or laboratory equipment or in other disciplines such as journalism.

16. Particular support for learning

The University has several points of support for students. Academic support is provided by the Learning Enhancement Team (LET) advising students on literacy, English language, and numeracy. The Disability Support Service offers support to disabled students during their time at Middlesex. The library team and subject librarian offer general and subject specific support with literature research and referencing.

There is an online learning platform to provide module and programme support. In the specific module area, students can find all module materials as well as other information to support learning include video material, links to reading lists, quizzes, and discussion boards.

Departmental Graduate Academic Assistants support students with their coursework and subject understanding in small group tutorials or on a 1:1 basis. Student Learning Assistants provide peer-learning support and can help students with their work in class as well as by meeting them individually or in small groups, especially during their first year at Middlesex. Each student will be allocated an academic advisor for the duration of their programme.

17. HECos code(s)

100344 (Biochemistry)
100352 (Medical Biochemistry)

18. Relevant QAA subject benchmark(s)

Biosciences (2023)

19. Reference points

- Middlesex University Regulations 2023.24
- Middlesex University Learning, Quality and Enhancement Handbook
- QAA for Higher Education, Subject Benchmarks, Biosciences, 2023
- Biochemical Society, Studying Biochemistry at Undergraduate Level, 2022

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 *BSc Biochemistry*

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	Underpinning scientific principles from the fields of biology and chemistry.
A2	Biological concepts, from molecular interactions to cellular processes to whole organism.
A3	Chemical concepts, from the building blocks of matter to inorganic and organic substances to reactions.
A4	Biochemical concepts including metabolism, molecular biology, immunology, bioinformatics and biochemistry in human health and disease.
A5	Applications of biochemistry to industry, health and the environment.
A6	Use of analytical techniques and their applications in research and technology.
A7	Environmental impact, sustainability and ethical responsibilities.
Skills	
B1	Critically evaluate information collated by laboratory experiments, from literature, informatics methods or online sources and apply information technology to review and evaluate evidence.
B2	Work effectively in the laboratory, apply good laboratory practice and competently operate equipment.
B3	Effectively communicate through a range of methods.
B4	Design research projects; collect, analyse, present, interpret and critically evaluate data.
B5	Appreciate ethical problems associated with biochemistry research and applications.
B6	Develop as a reflective and independent learner to work effectively as an individual and in interdisciplinary teams.
B7	Operate successfully in a culturally diverse and globally oriented society.

Programme outcomes													
A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7
Highest level achieved by graduates													
6	6	6	6	6	6	6	6	6	6	6	6	6	6

Module Title	Module Code by Level	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7
Professional Skills	BIO1120								x		x			x	x
Cell Sciences and Genetics	BIO1557	x	x						x		x				
Fundamentals of Biochemistry	BIO1609	x	x		x				x	x				x	
Form and Function	BIO1640	x	x							x				x	
Functional Biochemistry	BIO2401	x	x		x				x		x	x	X		
Biochemical Methods in Cancer Research	BIO2412				x	x	x		x	x	x				
Molecular Biology and Gene Control	BIO2557			x					x	x					
Applied Microbiology and Immunology	BIO2632		x		x	x		x	x						
Research Methods and Science Innovation	CHE2105	x						x	x		x	x	X	x	
Analytical and Organic Chemistry	CHE2325	x		x											
Sandwich Year in Industry or Research	BIO3003					x		x		x				x	x
Informatics for Bioscientists	BIO3111	x	x						x			x		x	
Biotechnology	BIO3215		x			x	x	x		x			X	x	
Applied Biochemistry	BIO3420			x	x	x	x		x	x	x	x			
Work Experience	BIO3799							x			x			x	x
Conservation, restoration, reconciliation	BIO3804	x	x	x		x		x	x			x		x	x
Dissertation	BIO3888	x						x	x	x	x	x	X	x	x
Pharmacology and Toxicology	BMS3311	x	x		x	x		x					X		x
Clinical Diagnostics	BMS3314		x		x	x	x		x		x		X	x	
Clinical Nutrition	BMS3446				x	x			x		x				x
Medical and Pharmaceutical Bioanalytical Techniques	CHE3786			x	x	x	x		x	x			X		