

## **BSc (Hons) Biomedical Science Programme Specification**

Academic Year:	2023-24
Degree Awarding Body:	University of Bradford
Final and interim award(s):	<b>BSc (Honours)</b> [Framework for Higher Education Qualifications (FHEQ) level 6] <b>BSc</b> [Framework for Higher Education Qualifications (FHEQ) level 6] <b>Diploma of Higher Education</b> [Framework for Higher Education Qualifications (FHEQ) level 5] <b>Certificate of Higher Education</b> [Framework for Higher Education Qualifications (FHEQ) level 4]
Programme accredited by:	Institute of Biomedical Science (IBMS)
Programme duration:	3 years – full-time 4 years – full-time with placement /study abroad year
UCAS code:	C900
QAA Subject benchmark statement(s):	Biomedical Sciences (2019)
Date last confirmed and/or minor modification approved by Faculty Board	March 2023

**Please note:** This programme specification has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but changes may occur given the interval between publishing and commencement of teaching. Any change which impacts the terms and conditions of an applicant’s offer will be communicated to them. Upon commencement of the programme, students will receive further detail about their course and any minor changes will be discussed and/or communicated at this point.

### **Introduction**

Biomedical Science is a key healthcare science involving a multidisciplinary approach to the study of human disease. Biomedical Science plays a critical role in saving lives and supporting scientists and medical teams to identify the requirements of critically ill patients and identify outbreaks of infectious diseases. It encompasses studies of the causes of disease and the effects of disease on the normal structure and functions of the human body and it provides an understanding of the scientific basis for the laboratory investigation, diagnosis, monitoring and treatment of disease. Graduates from the programme will have gained experience of biomedical science research and be familiar with the development of new diagnostic procedures and therapeutic intervention strategies.

The University of Bradford was one of the first biomedical science courses in the country. Since that time, the Bradford programme has developed to be innovative through its focus

on the development of practical skills based on real-world scenarios. Students on this programme will experience our industry-standard teaching and research laboratories, explore cutting-edge research, learn from research-active experts and have the opportunity to develop chosen areas of interest by specialising in Haematology, Cancer Biology, Medical Cell Biology, Medical Biochemistry or Medical Microbiology.

In addition, students will be able to tailor their course by choosing an employment-related module in one of the following areas:

- **Research Design:** providing an in-depth understanding of large-scale study design for students considering further study at Masters or PhD level.
- **Industry, Innovation and Healthcare:** providing an understanding of Good Laboratory Practice (GLP), Good Management Practice (GMP), Intellectual Property (IP) and patents for students who are considering progressing straight into employment within industry.
- **Science Education:** an introduction to the field of education for students who are considering applying for teacher training.

Our programme is accredited by the Institute of Biomedical Science (IBMS) and students graduating from it will have a broad-based scientific education coupled with the technical skills necessary for laboratory work. This broad-based education provides the foundation for a wide range of scientific careers in an 'in-demand' sector, including as a Biomedical Scientist in a hospital environment (after successful completion of the IBMS portfolio of competence in an accredited laboratory placement and registration with the Health and Care Professions Council after graduation), as a laboratory-based or non-laboratory-based scientist in the pharmaceutical industry and other related industries, or in academic research and teaching. However, whilst the degree provides a qualification necessary to start a professional career, graduates will need to continue to develop skills throughout their working life, due to the rapidly evolving nature of Biomedical Science. This programme couples a scientific education with the development of the skills necessary for lifelong learning.

The programme's aims and learning outcomes have been referenced to the University's Learning, Teaching and Student Experience Strategy (2020-2025), the Quality Assurance Agency for Higher Education's subject benchmark statement for Biomedical Sciences (2019), the Framework for Higher Education Qualifications, the Institute of Biomedical Science (IBMS) core competencies and the Health and Care Professions Council (HCPC) Standards of Proficiency.

## **Programme Aims**

The programme is intended to:

- Provide an accredited degree which meets the requirements of the IBMS that can enable graduates to apply to register with the HCPC as a Biomedical Scientist (after completing the IBMS certificate of competence portfolio in an appropriate training position).
- Enhance learning by providing a choice of study options to suit students' interests and/or career aspirations.

- Deliver a programme of study in Biomedical Science for students from diverse cultural and educational backgrounds.
- Develop subject knowledge and understanding in the core and optional areas of Biomedical Science as defined in the curriculum to reflect the Subject Benchmark Statement: including an awareness of the implications of ethnicity, gender and age, as well as social and cultural diversity in health and disease.
- Develop core discipline-specific skills as outlined in the curriculum to reflect the Subject Benchmark Statement.
- Develop research skills to reflect the Subject Benchmark Statement and prepare students for postgraduate study.
- Develop personal transferable skills that enable students to move successfully into employment or further education.
- Provide a supportive and structured environment in which students are encouraged to develop the independent study skills required for lifelong learning.

## Programme Learning Outcomes

To be eligible for the non-accredited award of Certificate of Higher Education at FHEQ level 4, students will be able to:

1. Demonstrate knowledge of the underlying concepts and principles of core aspects of Biomedical Science including Cell Biology, Genetics, Biochemistry, Molecular Biology, Physiology, Pathology, Microbiology.
2. Provide evidence of an ability to present, evaluate and interpret qualitative and quantitative data in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of their subject(s) of study.
3. Write scientific reports and communicate the results of their study/work accurately and reliably, with structured and coherent arguments.
4. Use a range of personal transferable skills including communication, information technology (including the use of the internet and other electronic devices as sources of information and means of communication), team-working, negotiating and decision-making, responsibility for self-directed learning and the time management skills that are required in a working environment.
5. Use skills associated with professional and ethical laboratory practice in Healthcare Science, including: SOP writing, COSHH /risk assessment, good laboratory practice, as well as respond appropriately to The Human Tissue Act 2004, governance, audit and quality control and assurance.

Additionally, to be eligible for the non-accredited award of Diploma of Higher Education at FHEQ level 5, students will be able to:

6. Demonstrate knowledge and critical understanding of the well-established principles of Biomedical Science, and of the way in which those principles have developed.

7. Discuss and evaluate the laboratory specialities of genetics, cellular pathology, clinical biochemistry, clinical immunology, haematology and transfusion science, and medical microbiology.
8. Select and evaluate experimental and clinical laboratory techniques and apply them to experimental and laboratory investigations.
9. Prepare, process, analyse (including numerical and statistical analysis) and interpret experimental/clinical laboratory data and present data in an appropriate format, applying skills in critical and analytical thinking and problem-solving.
10. Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences and interpret and critically review scientific literature.

Additionally, to be eligible for the award of Ordinary Degree of Bachelor at FHEQ level 6, students will be able to:

11. Demonstrate a systematic understanding of key aspects of Biomedical Science, including acquisition of coherent and detailed knowledge, informed by current research-led aspects of a discipline.
12. Demonstrate an ability to undertake autonomous learning.

Additionally, to be eligible for the award of Honours Degree of Bachelor at FHEQ level 6, students will be able to:

13. Devise and sustain arguments and solve problems, using ideas and techniques at the forefront of Biomedical Science to describe and comment on particular aspects of current research, or equivalent advanced scholarship, within the discipline.

## Curriculum

The curriculum has been developed as a spiral so that core knowledge is reinforced and built upon at each level of study, encouraging deep understanding and knowledge and embedding good practice in inclusive learning and teaching. The programme provides a study route which permits the maximum student choice consistent with the requirements of accreditation. In the first and second year of the degree (levels 4 and 5) all modules are core to ensure that students develop the necessary level of knowledge of Biomedical Science suitable for a career as a Biomedical Scientist or as a scientist in one of the many other professions that our graduates choose to follow. In the third year (level 6) students choose a semester 1 employability module related to their chosen career path as well as a discipline-specific module which aligns with their interests in the field of biomedical science. Choice is further embedded as part of the core research topics module, where students select not only the topic but also the scientific papers they will be assessed on.

Throughout the curriculum students will have the opportunity to develop the skills associated with biomedical laboratory practice including the ability to undertake COSHH and risk assessments and procedures to ensure compliance, and the importance of quality control and quality assurance.

The curriculum may change, subject to the University's programme approval, monitoring and review procedures, as improvements are made each year. More detail, including learning outcomes, is available for each unit in the individual module descriptors.

## Stage 1

At Stage 1, students study normal human biology at the level of the molecule, gene, cell, organ and organism along with introductory microbiology. Laboratory sessions, run in conjunction with the theoretical components, allow students to consolidate and apply their knowledge. Students are introduced to basic laboratory skills and skills for data handling and interpretation. Students will be supported to develop a reflective attitude to learning and develop numerical, written and oral communication, IT and group-working skills.

### Stage 1 Modules

FHEQ Level	Module Title	Type	Credit	Study Period	Module Code
4	Cell Biology	Core	20	1	BIS4016-B
4	Molecules of Life	Core	20	1	BIS4017-B
4	Laboratory and Professional Skills 1	Core	20	1+2	BIS4018-B
4	Human Physiology	Core	20	1+2	BIS4009-B
4	Introductory Microbiology	Core	20	2	BIS4013-B
4	Genetics	Core	20	2	BIS4019-B

At the end of stage 1, students will be eligible to exit with the award of Certificate of Higher Education if they have successfully completed at least 120 credits and achieved the award learning outcomes. **This award does not confer eligibility to register with The Institute of Biomedical Science (IBMS).**

## Stage 2

At Stage 2, the curriculum continues to concentrate on the core areas of Biomedical Science, in particular the laboratory disciplines. Students start to examine the processes that disrupt normal human biological function, and so cause disease, and explore the methods used to diagnose and treat disease. Laboratory sessions provide an opportunity to consolidate learning, enhance laboratory skills and to gain skills in data handling and interpretation.

Students are encouraged to develop their personal transferable skills and reflect on how these will prepare them for the working environment. During the skills module, students perform skill self-evaluations to identify and address areas for improvement. Acquisition of the skill is then assessed in the laboratory classes and recorded in the student skill tracker/log.

During the second year, students develop increasing autonomy in their learning, producing individual and group work and demonstrating increasing responsibility for achieving the learning outcomes of their modules and level of study. This is exemplified by the student-led team project in the laboratory and professional skills module. Students have opportunities to engage with case studies and workshop material, leading to debate and discussion of concepts and facts and enhancing the assimilation of ideas.

### Stage 2 Modules

FHEQ Level	Module Title	Type	Credit	Study Period	Module Code
5	Clinical and Analytical Biochemistry	Core	20	1	BIS5013-B
5	Medical Microbiology & Infection Science	Core	20	1	BIS5018-B
5	Immunology, Haematology and Transfusion Science	Core	20	1+2	BIS5012-B
5	Laboratory and Professional Skills 2	Core	20	1+2	BIS5019-B
5	Pathology	Core	20	2	BIS5015-B
5	Molecular Biology	Core	20	2	BIS5020-B

At the end of stage 2, students will be eligible to exit with the award of Diploma of Higher Education if they have successfully completed at least 240 credits and achieved the award learning outcomes. **This award does not confer eligibility to register with The Institute of Biomedical Science (IBMS).**

Students who successfully progress to Stage three by achieving 120 credits will be eligible to take a placement or study abroad year. Students who are required to repeat some, or all, of Stage two, or who progress to Stage three but have a referral in one or more modules will not be able to go on placement or study abroad.

FHEQ Level	Module Title	Type	Credit	Study Period	Module Code
5	School of Chemistry and Bioscience Placement Experience	Option	0	FLYR between stage 2 and 3	BIS5021-Z
5	School of Chemistry and Bioscience Study Abroad Experience	Option	0	FLYR between stage 2 and 3	BIS5022-Z

On successful completion of School of Chemistry and Biosciences Placement Experience, students will be eligible for the award of University Diploma in Professional Studies.

On successful completion of School of Chemistry and Biosciences Study Abroad Experience, students will be eligible for the award of University Diploma in Professional Studies (International).

### Stage 3

The main focus of stage 3 is on developing students into competent, confident autonomous scientists, able to continue to develop their own knowledge and understanding of human health and disease. In addition employability modules are embedded to assist students with their career plans.

Laboratory sessions, along with the individual research project, support students to further enhance their data handling and critical interpretation skills and increase the autonomy with which they can apply them. The individual research project is a capstone, which draws on the skills and knowledge acquired throughout the degree and applies them to a student-owned project. The project also allows the further development of advanced numerical, written and oral communication, IT and group-working skills, in an authentic workplace relevant context.

In semester 1, students select an employability module to align with their potential career path and a specialist module to reflect their subject interests. Students are given the opportunity to select a final year project which is aligned with their final year option choices. All optional module combinations lead to an IBMS-accredited degree.

## Stage 3 Modules

FHEQ Level	Module Title	Type	Credits	Study Period	Module Code
6	Biomedical Science Research Project	Core	40	1+2	BIS6026-D
6	Clinical Genetics and Genomic Medicine	Core	20	1	BIS6052-B
6	Biology of Disease	Core	20	2	BIS6012-B

One module from the following choices:

FHEQ Level	Module Title	Type	Credits	Study Period	Module Code
6	Industry, Innovation and Healthcare	Option	20	1	BIS6031-B
6	Research Design	Option	20	1	BIS6032-B
6	Science Education	Option	20	1	BIS6033-B

One module from the following choices:

FHEQ Level	Module Title	Type	Credits	Study Period	Module Code
6	Diagnostics in Biochemistry and Immunology	Option	20	2	BIS6017-B
6	Diagnostic Histopathology	Option	20	2	BIS6019-B
6	Diagnostic Microbiology	Option	20	2	BIS6022-B
6	Cancer Biology	Option	20	2	BIS6028-B

Students will be eligible to exit with the award of Ordinary Degree of Bachelor if they have successfully completed at least 120 credits in both Level 4 and 5 and 60 credits at level 6 and achieved the award learning outcomes. **This award does not confer eligibility to register with The Institute of Biomedical Science (IBMS).**



Students will be eligible for the award of Honours Degree of Bachelor if they have successfully completed at least 360 credits and achieved the award learning outcomes.

**Upon successful completion of the IBMS-accredited BSc Hons degree, graduates will be eligible to complete the IBMS certificate of competence portfolio whilst in a training position in an accredited laboratory; this then enables them to apply to register with the HCPC as a Biomedical Scientist.**

## Placement and/or Study Abroad

This programme provides the option for students to undertake a work placement between years two and three. This year can be a study abroad year or a work placement. This provides valuable experiential learning in a healthcare setting or in the pharmaceutical or biosciences sector. Not only will this improve students' understanding of final year material through application of knowledge, it may also significantly enhance employment opportunities.

There are also opportunities to undertake an additional year of study through the International Student Exchange Programme (ISEP) in over 30 countries including the United States, Ghana, Uruguay and at many European Universities. This is an exciting way for students to enhance their CV in an increasingly global environment and develop understanding of other cultures and language skills.

For further information about study abroad opportunities please refer to <https://www.bradford.ac.uk/study/abroad/>

## Learning and Teaching Strategy

The learning and teaching strategy takes into consideration the knowledge and skills needed in industry, progression through stages of study, the nature of topics studied and the need for students to demonstrate greater autonomy in their learning as they progress through the programme.

Online learning packages and formal lectures will facilitate acquisition of knowledge and understanding of Learning Outcome 1 (LO 1) and discipline-specific skills (LO 6, 7 and 11). Laboratory sessions run in conjunction with the theoretical components will provide the opportunity to enhance understanding of particular topics (LO 2-5). These will also help to develop discipline-specific skills (LO 6-7) and personal transferable skills (LO 4, 5 and 8). Tutorials, workshops and case studies will develop knowledge and understanding, discipline-specific skills and personal transferable skills (LO 9-10). Team-based learning is used in the L4 Genetics, L5 Molecular Biology and L6 Biology of Disease modules to help enhance depth of learning and improve understanding (LO 6, 7, 8 and 13). Discipline-specific skills will be further enhanced in the specialist optional modules in the final year (LO 11 and 13). Directed study, involving directed reading of appropriate texts and the preparation of assessed work, is used to develop the student as an autonomous learner (LO 12).

## Assessment Strategy

The assessment strategy is designed to allow students to demonstrate achievement of the learning outcomes of an individual module appropriate to the level of study and the learning outcomes of the programme. These learning outcomes are consistent with the Framework for Higher Education Qualifications.

At level 4, learners will be assessed primarily on their breadth of knowledge by multiple choice question (MCQ) examinations. Coursework assignments will give students the opportunity to gain experience in practical laboratory skills, presentations, report writing, data handling and critical interpretation.

As students progress to level 5, assessments focus on depth of understanding and application of knowledge.

In the final year, a diverse range of assessments build learners' communication, interpretative and critical skills to ensure that they are fully prepared for the world of work post-graduation.

The project report provides a major opportunity to demonstrate autonomy in data handling and critical interpretation in a research context.

Formative assessments are embedded at all levels of the programme to allow students to test their knowledge and understanding.

## Assessment Regulations

This Programme conforms to the standard University Assessment Regulations which are available online at [www.bradford.ac.uk/regulations](http://www.bradford.ac.uk/regulations).

However, there are exceptions to these regulations as listed below:

1. Compensation is not permitted. This means that all modules must be passed at 40% or higher in order to be eligible for a final award of BSc (Hons).
2. Students must pass specified individual components within modules at the pass-mark stated in the module descriptor.
3. The Level 5 Laboratory and Professional Skills 2 practical skills portfolio must be passed in order to progress to stage 3 of the programme.

## Admission Requirements

We take into consideration a number of factors when assessing your application. It's not just about your grades; we take the time to understand your personal circumstances and make decisions based on your potential to thrive at university and beyond. Consideration of applications will be based on a combination of formal academic qualifications and other relevant experience.

The minimum entry requirements for the programme are as follows:

A typical offer is 112 UCAS points which should include either A-level Biology or Chemistry at grade B or above. Please note that where a science A-level is taken, the University will

require applicants to pass the practical element (for A levels awarded from August 2017 onwards). Under the points system introduced in 2017, AS levels will be worth 40% of an A Level. GCSE passes should include English, Mathematics and two Sciences at grade C or 4 (equivalents accepted). For applicants on Access Programmes, a typical offer is 122 UCAS tariff points. Applicants must be studying an Access to Higher Education Diploma in a Science subject and achieve a minimum of 12 credits of Biology or Chemistry at Distinction. For BTEC extended diplomas we require DDD in a relevant Science to include specific units (contact admissions for a current list). For T-level we require a merit with subject specific requirement in Science.

International students should have IELTS 6 (a requirement of the accrediting body - Institute of Biomedical Science) with no sub-test less than 5.0 and have equivalent qualifications to GCSE Grade C or 4 in Science and Maths. Applications are also welcome from mature students (those over 21 years of age on entry) and candidates with non-standard qualifications or who, lacking academic qualifications, have significant relevant experience. On completion of a UCAS form applicants will be invited to the School for an Applicant Experience Day when they will have the opportunity to meet staff, view the facilities and discuss “the Bradford experience” with current students.

The UCAS tariff applicable may vary and is published here:

<http://www.bradford.ac.uk/study/courses/info/biomedical-science-bsc-3-years>

**Please note:** This link provides admission information relevant to the current recruitment cycle and therefore may be different to when this document was originally published.

## Recognition of Prior Learning

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University has procedures to evaluate and recognise this learning in order to provide applicants with exemptions from specified modules or parts of the programme.

## Minor Modification Schedule

Version Number	Brief description of Modification	Date of Approval (Faculty Board)