

Advanced Biomedical Engineering MSc

Programme Specification

Academic Year:	2026/27
Degree Awarding Body:	The University of Bradford
Main Location:	City Campus
Subject Benchmarks:	Engineering (Quality Assurance Agency 2015)
Qualifications Framework:	HE Qualifications of UK Degree Awarding Bodies (FHEQ: QAA 2014)
Target Degree Award:	Master of Science (MSc) Advanced Biomedical Engineering [FHEQ Level 7]
Intermediate/exit awards:	MSc Engineering (Biomedical) or Postgraduate Diploma (PGD) Advanced Biomedical Engineering or Postgraduate Certificate (PGC) Advanced Biomedical Engineering [L7]
Programme Admissions:	UK and international students
Programme Start Dates:	September, January
Programme Modes of Study:	12 months full-time (September start) 12 months full-time (January start)

This programme is accredited by the Institution of Engineering and Technology (IET) and the Institute of Mechanical Engineers ([IMechE](#)) on behalf of the Engineering Council ([EngC](#)) as meeting the requirements for Further Learning for registration as a Chartered Engineer (CEng) with the target award. Candidates must hold a CEng accredited BEng or BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

Please note: The University has a set of terms and conditions for all students accepting an offer to study on a course here at Bradford. This is called the Student Contract. This document sets out the Terms and Conditions which apply when you accept an offer of a place on a programme of study at the University of Bradford. [View our Student Contract for further details](#). Information about this programme and its modules 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.

Minor Modification Schedule

1. July 2025: Annual Changes for the 2025 academic year, including changes to academic regulation.
2. April 2026: Annual changes for the 2026 academic year.

Introduction

Biomedical Engineering combines engineering expertise and applied principles with biology and electronics to solve biomedical problems and improve the wellbeing of patients in healthcare and

everyday life. Many significant diagnostic and therapeutic advances have been pioneered by biomedical engineers, part of a growing discipline which is only increasing in importance.

Biomedical engineering is a fast-evolving interdisciplinary field, which has been at the forefront of many biomedical advances in recent years. As such, it is a research-led discipline, which sits at the forefront of advances in medicine, engineering and biology. It is highly interdisciplinary in nature and requires engineers who are flexible, able to acquire new skills, and who have a broad knowledge base.

This MSc programme has grown out of the internationally recognised research activity of the Biomedical Engineering Research Team which has a long and established record of delivering Bachelors level teaching in the Biomedical and healthcare field. The Biomedical Engineering Research Team has particular research strengths in Clinical Movement Analysis; Biomaterials Science; Tissue/Cell Engineering; and Medical and Healthcare Electronics, and Diagnostics. We have state of the art research facilities in these areas. As such, the programme draws on the broad range of expertise within the Biomedical Engineering Research Team and integrates this in a coherent programme of study. Our course has research links with local hospitals in Yorkshire and works closely with clinicians from these establishments. It has on going collaborative research with various commercial organizations, including, Smith and Nephew, DePuySynthes (J&J), Biomet Healthcare UK Ltd, GE Healthcare, BRI, LGI and Dyson Ltd.

Lecturers at the University of Bradford are active researchers in their fields of expertise, developing new knowledge, contributing to peer-reviewed journals and books. This research permeates to their teaching practice giving students access to world leading professionals, equipment and ideas within the University's academic themes of Innovative Engineering, Advanced Healthcare and Sustainable Societies. Each year students will engage in enquiry-based projects allowing learning through practical research. The programmes of study include research with an emphasis on application, experiential learning and real-world engagement. This will make a major contribution to students' skill sets, in the skills and attributes for enhanced employability.

[The Faculty of Management, Sciences and Engineering](#) welcomes and celebrates the diverse cultural and national backgrounds of our students. We are committed to an educational experience that is inclusive of the diversity of the students and staff, and that addresses attainment gaps within our student body, particularly those between BME and white students. The University of Bradford holds Bronze [Athena Swan Charter](#) and [Race Equality Charter](#) accreditations from [AdvanceHE](#), recognising our commitment to advancing the careers of everyone in STEM.

We also recognise that the future for engineers is one where they will be working in interdisciplinary teams to solve new, complex and evolving problems that will require innovative solutions. Students' ability to work across engineering disciplines and collaboratively with experts in other specialist fields will be crucial to creating the solutions of tomorrow. We have designed our programmes to encourage and experience interdisciplinary working, to develop breadth as well as depth of skills and knowledge, and in this way, we believe students will be ideally equipped to be successful and employable.

The Bradford Graduate

We recognise that society benefits from the talents of all, and that the development of creative, collaborative engineers, skilled in communication and teamwork is vital. Diverse engineering teams are known to be more innovative. We help students to contribute to and learn from the varied perspectives of their tutors and peers. We want to equip our graduates with the knowledge and skills to respond to the many diverse needs of our businesses and communities.

Upon completion of the programme students will have the capacity for meaningful interdisciplinary interaction, leadership roles, and professional growth. Given the research-lead nature of the discipline, there is demand for engineers who can work effectively in a research-lead environment and who can push forward technological boundaries. Consequently, there is a need for people with advanced knowledge and skills, who have a good appreciation of developments in the clinical and biological fields. Thus, this MSc programme at the University of Bradford is designed to provide an advanced Biomedical engineering education and to give students an opportunity to develop advanced knowledge and understanding in specialist subject areas.

In particular, the programme contains a large project component which allows students to develop advanced knowledge and research skills in their specialist area. As such, the programme also aims to develop a multidisciplinary understanding of the subject, which can be applied in a variety of clinical, biomedical and industrial settings. We aim to produce MSc graduates who are imaginative, innovative, versatile and competitive. With reference to teaching and learning, the Faculty aims to produce postgraduates who aspire to challenging careers in industry, commerce and the public sector or to developing their own enterprises. Students should therefore be able to move directly into responsible roles in employment with a minimum of additional training.

Having completed the programme, students will be able to work as any of:

- a) Biomedical Engineer
- b) Design and/or Project Engineer
- c) Research and Development Engineer (R&D) in Biomedical and/or Healthcare Technologies Industries.
- d) Clinical Engineer

Students will have the capacity, potential and opportunity for professional growth to continue the path to Chartered Engineer (CEng) status. The ability of an engineer to think clearly and logically is widely appreciated by many other professions and studies at Bradford may well be a stepping stone to many alternative careers other than Engineering – a real foundation for life and for a lifetime of learning.

Programme Aims

- Provide students with education in advanced biomedical engineering, i.e., advanced theoretical knowledge, concepts and skills necessary for problem analyses related to medical, clinical and biomedical engineering.

- Enable students to carry out independently, but under supervision, a specific research project in medical, clinical and biomedical engineering.
- Provide bridging information to non-specialists enabling them to extend their career opportunities.
- Develops students' personal transferable skills, to enable graduates to pursue programmes of advanced study, or to move directly into responsible employment.

Programme Learning Outcomes

On successful completion of the programme, holders of a Master of Science degree award will be able to demonstrate all of the following outcomes:

1. Evidence comprehensive understanding of relevant scientific principles of discipline specialization, applying knowledge (possibly at discipline forefront), understanding, and skills to work with (incomplete or uncertain) information, quantifying the effect of this on the design, and using theory or experiment to mitigate deficiencies.
2. Select and apply appropriate advanced modelling and analysis methods and computational tools to critically evaluate complex and multidisciplinary problems in engineering, generate (optimized) solutions, and assess their limitations, robustness, and effects of changes in design parameters.
3. Evidence advanced level knowledge and understanding of a wide range of engineering materials and components.
4. Critically evaluate current problems and/or new insights informed by the specialization forefront and apply and adapt knowledge and comprehensive understanding of design processes and methodologies in unfamiliar situations.
5. Work effectively in a team in order to meet shared objectives.
6. Evidence awareness of the need for a high level of professional and ethical conduct in engineering, evidencing business and management practices relevant to engineering and engineers
7. Evidence understanding and critical evaluation of concepts relevant to discipline, some from outside engineering, and apply them effectively (including in engineering projects).
8. Integrate engineering knowledge and insight to investigate new and emerging technologies, applying professional judgements to balance risks, cost, benefits, safety, reliability and environmental impact.
9. Evidence self-direction, independent learning, and originality of thought to generate innovative designs for products, systems, components or processes to fulfil new needs.
10. Use software packages in the advanced analysis, design, evaluation, and optimisation of complex engineering systems.

11. Apply skills in problem solving, communication, information retrieval, working effectively with general IT facilities to develop, monitor and update a plan for the solution of both technical and personnel contributions to meeting organisational need.
12. Plan self-learning to improve performance as a foundation for lifelong learning/CPD, and exercise initiative and personal responsibility in professional practice, which may be as a team member or leader, evidence good negotiation, written and oral communication skills.
13. Plan, implement, monitor and adjust on an on-going basis, a self-directed individual research programme of work, evidencing collection and critical analysis of research data, use or adaptation of appropriate analysis tools to tackle unfamiliar problems (e.g., those with uncertain or incomplete data or specification), innovation, and application of relevant skills, reflection, and research methodologies in the production of an advanced technical report.

Curriculum

The curriculum map shows the core and optional units for this programme, which extends over 12 months. It is made up of a taught element of 120 credits and an individual research project element of 60 credits. Please note that 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 module handbooks.

The taught element is structured in the form of 20 credit modules over the 2 semesters forming the "Academic Year" of September-May. In each of Semester 1 (September) and Semester 2 (January), students study 40 core credits and choose 1 from 3 optional modules for a total of 120 credits. Students who start in January study Spring modules first.

Table 1: Advanced Biomedical Engineering taught modules (FHEQ Level 7)

Code	Module Title	Credit	Study Period	Selection
MHT7013-B	Regenerative Medicine	20	Autumn (Sem1)	Core
MHT7015-B	Telemedicine & E-Health	20	Autumn (Sem1)	Core
ENB7008-B	Supply Chain Management & Production	20	Autumn (Sem1)	Option 1
COS7049-B	Statistical Applications of Industrial Big Data	20	Autumn (Sem1)	Option 2
COS7046-B	Big Data Visualisation	20	Autumn (Sem1)	Option 3
MHT7008-B	Clinical Biomechanics	20	Spring (Sem2)	Core
MHT7014-B	Clinical Diagnostics	20	Spring (Sem2)	Core
CPE7004-B	Food and Pharmaceutical Processes Engineering	20	Spring (Sem2)	Option 4
CFS7028-B	Imaging	20	Spring (Sem2)	Option 5
CPE7012-B	Polymer and Materials Engineering	20	Spring (Sem2)	Option 6

Students will be eligible to exit with the FHEQ Level 7 award of Postgraduate Certificate if they have successfully completed 60 credits. Students will be eligible to exit with the FHEQ Level 7 award of Postgraduate Diploma if they have successfully completed at least 120 credits.

The 60 credits MSc research project is carried out throughout the year and over the summer.

Table 2: Advanced Biomedical Engineering research project (FHEQ Level 7)

Code	Module Title	Credit	Study Period	Selection
ENG7002-E	MSc Project	60	Full Year	Core

At the end of the programme, students will be eligible to exit with the FHEQ Level 7 Master's Degree award of MSc Engineering (Biomedical) if they have successfully completed at least 180 credits and achieved the award learning outcomes but not met the criteria for an accredited award.

Students will be eligible for the FHEQ Level 7 Master's Degree award of MSc Advanced Biomedical Engineering if they have successfully completed at least 180 credits, achieved the award learning outcomes and met the programme-specific accredited award criteria.

Learning and Teaching Strategy

The teaching and learning strategy takes into consideration the learning outcomes, the nature of the subject and the student intake, and the need for students to take greater responsibility for their own learning as they progress through the Programme.

Our strategy begins with the end in mind. We want students to become great engineers; that means great problem solvers, great team-workers with an inquisitive and curious mind. This should mean that by the end of their study with us they can move seamlessly into the world of work, academic research or become an entrepreneur.

The teaching and learning methods have been selected to engage students in developing their knowledge and understanding of engineering fundamentals, through formal learning opportunities such as lectures and tutorials, experiential learning through practical classes and lab sessions and informal and social learning through team-working in projects and competitions.

Study with us will include formal lectures (including those from visiting lecturers and invited speakers). Tutorials and seminars will often be in smaller groups and highly interactive. We want to develop students understanding of the vast array of opportunities open to today's professional engineer and therefore we look to incorporate aspects of real- world engineering problems and solutions where possible. To this end we make use of case studies, practical demonstrations, and provide lots of opportunities for students to design their own solutions. Students will operate analytical instruments in Semester 2, under supervision, during the initial phase of their research project.

Assessment Strategy

In the same way that our teaching and learning strategy is designed to prepare students for the world of work, academic research or entrepreneurship, our assessment methods incorporate a wide range of different methods designed to meet the needs of industry, the accrediting bodies as well as prepare students for a potential academic research career.

Assessment is a key part of the learning process, it is only through challenging themselves to express what they have learned or put it to practical use, can students complete the learning journey and assess for themselves if they have understood what they have been taught and are able to apply and use those skills and knowledge.

There are two forms of assessment: formative and summative. Formative assessment provides an opportunity for our staff to give students feedback during their learning. This feedback is designed to help and guide student learning. All the modules will have some formative assessment, and this may be in various forms including discussions or questioning from the supervisor, tests, practical activities, et cetera. These formative activities are crucial if students are to make best use of their learning experience and they are designed to prepare students for their summative assessment.

Summative assessment is how we grade the work on a module and the details of this assessment will be available from the beginning of the module so that students understand how their grade will be determined. A main method of assessment (as is common on all professional engineering degree programmes) is by formal written examinations. Nevertheless, many of the assessments will be tailored to the most efficient ways the learning outcomes. Therefore, project work will often be assessed on the basis of the quality of the product produced as part of the project; we use practical tests to assess practical skills and written reports to show the depth of understanding of concepts and ideas.

Practical skills are often assessed via individual and group technical reports with the laboratory work linked with the taught modules. The methods of assessment of transferable skills are built in the structure of the examinations, case studies, laboratory demonstrations and project work.

Assessment, Continuation and Award Regulations

This programme follows the Assessment, Continuation and Award regulations published on the University's website for postgraduate courses ([Regulation 9](#)) with variance from the regulation as outlined below and documented in the Variance Register:

- Variance from 4.2 - the pass threshold for each of the modules for the accredited award is 50% or higher in 160 credits and a minimum mark of 40% or higher in 20 credits
- Variance from 4.2 - Students must achieve a minimum of 30% in any individual assessment component that contributes more than 30% to the overall module mark.
- Variance from 5.1- Students must achieve 30% or more in assessment components which have a weighting of 30% or more, will be permitted a supplementary assessment in that component.
- Variance from 5.1, 5.2 & 5.3 - Students who achieve marks between 40% and 49% in up to 60 credits worth of modules will be permitted one supplementary assessment attempt in order to support continuation on the accredited MSc.

Students who do not meet the threshold outlined above but do meet the standard requirements of Regulation 9 for Postgraduate Taught Assessment, Continuation and Award Regulations will be eligible for an MSc Engineering (Biomedical), which is a non-accredited award.

Admission Requirements

We are proud to be [one of the most inclusive universities in the UK](#). All our students have potential, and we believe that as many people as possible should have the chance to benefit from higher education, no matter what their background or circumstances.

We take the time to understand the background of our applicants, understand their journey to education, and make decisions based on an applicant's potential to thrive at university and beyond.

For international students, the level of English required is listed on the [University of Bradford English language requirements website](#). Exceptionally, holders of a UK degree awarded within 2 years prior to entry to the Bradford programme may be exempt from these English test requirements. International applicants who do not meet the IELTS requirement can take a [University of Bradford pre-sessional English course](#).

In addition to satisfying the general admissions requirements of the University of Bradford, the typical applicant profile for this programme is to have at least an undergraduate (Honours) degree classified at 2:2 or above in Biomedical/Medical Engineering, Clinical Technology, or related engineering/science field, from an accredited degree awarding body.

International students are welcome to apply and should [check the entry requirements page for their country on our website](#) details of equivalent qualifications.

Applications are welcome from students with non-traditional qualifications, and/or significant personal/professional experience. Candidates who do not fulfil the normal entry requirements but have extensive industrial experience related to Medical/Biomedical Engineering are considered on an individual basis.

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University of Bradford has procedures to evaluate and recognise this learning to provide applicants with exemptions from specified modules or parts of the programme. Find more information about [recognition of prior learning decisions](#) on the University website.

People thinking of studying with the University of Bradford don't need to wait for the start of the year to contact our Disability Service. The University can arrange for anyone to talk to this team about what support is on offer at Bradford including an invitation to our Get Set Day. To contact the Disability Service please complete the [request support form](#).

Information in this document is for the contemporary recruitment cycle and was accurate at time of publication. The current tariff and accepted qualifications for entry onto the programme is published at the online course page:

<http://www.bradford.ac.uk/courses/pg/advanced-biomedical-engineering/>