

Programme Specification

BEng Biomedical Engineering

For students entering Part 1 in September 2024

UCAS Code: H160

UFBIOENGB

UFBIOENGBSY

UFBIOENGBWY

This document sets out key information about your Programme and forms part of your Terms and Conditions with the University of Reading.

Awarding Institution	University of Reading
Teaching Institution	University of Reading
Length of Programme	3 years
Length of Programme with placement/year abroad	BEng Biomedical Engineering with Study Year Abroad - 4 years (internal transfer only) BEng Biomedical Engineering with Industrial Year - 4 years (internal transfer only)
Accreditation	Accreditation to be sought from the Institute of Engineering and Technology (IET) and the Institute of Physics and Engineering in Medicine (IPEM).
QAA Subject Benchmarking Group	Engineering

Programme information and content

The programme aims to provide you with a thorough degree-level education in biomedical engineering, equipping you to deliver engineering solutions to complex healthcare problems. You will learn to apply a grounding in the fundamental principles of engineering and relevant aspects of biology to the design of devices, systems, and techniques for the diagnosis, monitoring, management and treatment of diseases, lesions, disorders and infirmity.

Our course combines lectures with active learning approaches and digitally-enabled learning activities to enrich your educational experience, providing you with the core discipline-specific knowledge and practical and transferable skills to help you to flourish in your professional career.

With a distinctive emphasis on technological advances within biomedical engineering, our programme provides you with the ability to evaluate and create revolutionary advancements in medical diagnostics and therapy, placing you at the leading edge of modern medicine.

The course is structured to allow seamless transition and incremental progression, which builds on prior knowledge and experience and is designed to reinforce core material while introducing challenging and stimulating new concepts at stage-defined timepoints. The end result is a carefully-choreographed learning environment which promotes acquisition of

transferable skills and theoretical knowledge but also the self-confidence and assuredness with which to apply them in a professional setting.

Part 1:	Part 1 (year 1): Introduces you to the fundamental underpinning principles and techniques in biology and engineering needed for a career in biomedical engineering.
Part 2:	Part 2 (year 2): Provides you with the ability to apply your knowledge and understanding in more advanced areas of biomedical engineering, building upon the fundamentals learned in Part 1. You will gain additional practical skills and experience, and will work in teams to design and develop an engineering solution for a real-world health-related need.
Placement/Study abroad year:	Placement/Study abroad year: A placement year, if undertaken, provides the opportunity to obtain practical experience and apply academic knowledge. It also helps provide focus in the final year of academic study. Students gain transferable skills demanded by graduate employers and on return to university are better informed about future career paths. A year abroad provides the opportunity for students to broaden both their academic and cultural awareness.
Part 3:	Part 3 (year 3): Gives you the opportunity to specialise in the areas of biomedical engineering that interest you the most, with a range of options informed by current research and clinical practice. You will gain experience in planning, managing, and conducting your own in-depth research project in biomedical engineering.

Programme Learning Outcomes - BEng Biomedical Engineering

During the course of the Programme, you will have the opportunity to develop a range of skills, knowledge and attributes (known as learning outcomes) For this programme, these are:

Learning outcomes	
1	Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex biomedical problems. Some of the knowledge will be at the forefront of biomedical engineering.
2	Select and apply appropriate engineering concepts and computational and analytical techniques to analyse, model and solve complex biomedical problems, drawing on first principles of mathematics, statistics, natural science and engineering and recognising the limitations of the techniques employed.
3	Search for, critically analyse, integrate, synthesise and evaluate scientific literature to draw conclusions, make hypotheses and suggest solutions.
4	Use a creative, innovative and evidence-based approach to propose realistic solutions for complex biological and real-world problems in light of continued scientific advances.

5	Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts; identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct; use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity; adopt a holistic and proportionate approach to the mitigation of security risks; and adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.
6	Safely and competently use a range of practical laboratory and/or field skills and techniques to generate accurate records and robust datasets
7	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.
8	Discuss the role of quality management systems and continuous improvement in the context of complex problems.
9	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.
10	Organize and manage workload to complete tasks and projects effectively, both independently and collaboratively as part of a team.
11	Effectively communicate subject specific knowledge, concepts and research outputs to technical and non-technical audiences using a range of multimedia formats.
12	Plan and record self-learning and development as the foundation for lifelong learning/CPD.

You will be expected to engage in learning activities to achieve these Programme learning outcomes. Assessment of your modules will reflect these learning outcomes and test how far you have met the requirements for your degree.

To pass the Programme, you will be required to meet the progression or accreditation and award criteria set out below.

Module information

Each part comprises 120 credits, allocated across a range of compulsory and optional modules as shown below. Compulsory modules are listed.

Part 1 Modules:

Module	Name	Credits	Level
BI1AP3	Anatomy and Physiology	20	4
BI1CMP1	Cellular and Molecular Principles of Life	20	4
BI1MA3	Mathematics	20	4
BI1PE2	Essentials of Physics for Medicine	20	4
BI1PR3	Programming	20	4
BI1RM2	Robotics in Medicine and Prosthetics	20	4

Part 2 Modules:

Module	Name	Credits	Level
BI2PPI1	Principles of Physical Interventions in Medicine	20	5
BI2PS2	Biomedical Problem Solving	20	5
BI2RPS3	Research and Professional Skills	20	5
BI2SF1	Biomedical Signal Processing and Feedback Systems	20	5
BI2SW1	Biomedical Sensors and Wearable Technology	20	5

Remaining credits will be made up of optional modules available in the School of Biological Sciences or modules from an approved list.

Modules during a placement year or study year (if applicable):

Module	Name	Credits	Level
BI2PEX	Professional Experience	120	5

The BEng Biomedical Engineering with Industrial Year includes a year-long industrial placement. Many students find that the experience and knowledge gained during the Industrial Year allows them to make better use of their final year of University study, and provides useful background knowledge for more permanent career choices.

If you take a year-long placement or study abroad, Part 3 as described below may be subject to variation.

Part 3 Modules:

Module	Name	Credits	Level
BI3BCI2	Brain-Computer Interfaces and Assistive Technology	20	6
BI3BS1	Biomechanics and Soft Technologies	20	6
BI3RP3	Research Project	40	6

Remaining credits will be made up of optional modules available in the School of Biological Sciences or modules from an approved list.

Placement opportunities

Placements:

You may be provided with the opportunity to undertake a credit-bearing placement as part of your Programme. This will form all or part of an optional module. You will be required to find and secure a placement opportunity, with the support of the University

Study Abroad:

You may be provided with the opportunity to undertake a Study Abroad placement during your Programme. This is subject to you meeting academic conditions detailed in the Programme Handbook, including obtaining the relevant permissions from your School, and

the availability of a suitable Study Abroad placement. If you undertake a Study Abroad placement, further arrangements will be discussed and agreed with you.

Optional modules:

The optional modules available can vary from year to year. An indicative list of the range of optional modules for your programme can be found online in the Course Catalogue. Details of optional modules for each part, including any additional costs associated with the optional modules, will be made available to you prior to the beginning of the Part in which they are to be taken and you will be given an opportunity to express interest in the optional modules that you would like to take. Entry to optional modules will be at the discretion of the University and subject to availability and may be subject to pre-requisites, such as completion of another module. Although the University tries to ensure you are able to take the optional modules in which you have expressed interest this cannot be guaranteed.

Teaching and learning delivery:

You will be taught through lectures, tutorials, practical classes and project work. Some modules may include group work.

Elements of your programme will be delivered via digital technology.

The scheduled teaching and learning activity hours and amount of technology enhanced learning activity for your programme will depend upon your module combination. In addition, you will undertake some self-scheduled teaching and learning activities, designed by and/or involving staff, which give some flexibility for you to choose when to complete them. You will also be expected to undertake guided independent study. Information about module study hours including contact hours and the amount of independent study which a student is normally expected to undertake for a module is indicated in the relevant module description.

Accreditation details

If accreditation of this programme is approved, graduates from this programme may, after a period of professional experience, together with other appropriate educational requirements, apply for Chartered Engineer status.

Assessment

The programme will be assessed through a combination of written examinations and coursework (including class tests). Further information is contained in the individual module descriptions.

Progression

Part 1

To achieve a threshold performance at Part 1, a student will normally be required to:

- (i) Obtain an overall average of 40% over 120 credits taken in Part 1;
- (ii) Obtain a mark of at least 40% in individual modules amounting to not less than 80 credits taken in Part 1; and
- (iii) Obtain marks of at least 30% in modules amounting to 120 credits.

In order to progress from Part 1 to Part 2, a student must achieve a threshold performance; and

(iv) a mark of at least 40% in individual modules amounting to not less than 120 credits; and.

(v) a mark of at least 30% in each assessment

The achievement of a threshold performance at Part 1 qualifies a student for a Certificate of Higher Education if they leave the University before completing the subsequent Part.

Transferring from a Joint Honours to a Single Honours programme

Students are able to transfer from a Joint Honours to a Single Honours programme in one of their joint subject areas at the end of Part 1, subject to fulfilling the Part 1 University Threshold Standard, achieving marks of at least 40% in at least 40 credits of modules in the subject to which they wish to transfer, and fulfilling any programme-specific progression rules for the Part 1 Single Honours Programme to which they wish to transfer.

Students who transfer from a Joint Honours to a Single Honours programme may not have taken all of the Part 1 modules listed in the Single Honours Programme Specification. The modules which they have taken will be shown on their Diploma Supplement.

Part 2

To achieve a threshold performance at Part 2, a student shall normally be required to:

- (i) Obtain a weighted average of 40% over 120 credits taken in Part 2; and
- (ii) Obtain marks of at least 40% in individual modules amounting to at least 80 credits taken in Part 2; and
- (iii) Obtain marks of at least 30% in individual modules amounting to at least 120 credits, except that a mark below 30% may be condoned in no more than 20 credits of modules owned by the Department of Mathematics and Statistics.

In order to progress from Part 2 to Part 3, a student must achieve a threshold performance; and

(iv) a mark of at least 40% in individual modules amounting to not less than 120 credits; and

(v) a mark of at least 30% in each assessment.

The achievement of a threshold performance at Part 2 qualifies a student for a Diploma of Higher Education if they leave the University before completing the subsequent Part.

Professional/placement year

Students are required to pass the professional placement year/study abroad year in order to progress on the programme which incorporates the professional placement year/study abroad year. Students who fail the professional placement year/study abroad year transfer to the non-placement year version of the programme.

Classification

To be eligible for honours, a student shall normally be required to achieve the following in Part 3:

- (i) a mark of at least 40% in individual modules amounting to not less than 100 credits; and
- (ii) a mark of at least 30% in individual modules amounting to not less than 120 credits; and
- (iii) a mark of at least 30% in each assessment; and
- (iv) a mark of at least 40% in the BI3RP3 project module.

Bachelors' degrees

The University's honours classification scheme is based on the following:

Mark Interpretation

70% - 100% First class

60% - 69% Upper Second class

50% - 59% Lower Second class

40% - 49% Third class

35% - 39% Below Honours Standard

0% - 34% Fail

The weighting of the Parts/Years in the calculation of the degree classification is:

Three year programmes:

Part 2: one-third

Part 3: two-thirds

Four year programmes, including industrial year and study year abroad

Part 2: one-third

Industrial year: Placement year not included in the classification

Study abroad: Year abroad not included in the classification

Part 3: two-thirds

The classification criteria for Bachelor's degrees can be found [here](#) in Section 17.

Additional costs of the programme

None.

Costs are indicative and may vary according to optional modules chosen and are subject to inflation and other price fluctuations. Estimates were calculated in 2023.

For further information about your Programme please refer to the Programme Handbook and the relevant module descriptions, which are available at <http://www.reading.ac.uk/module/>. The Programme Handbook and the relevant module descriptions do not form part of your Terms and Conditions with the University of Reading.

BEng Biomedical Engineering for students entering Part 1 in session 2024/25

17 July 2023

© The University of Reading 2023