Course Information Document: Undergraduate

For Academic Year 2025/26

1. What is a Single Honours programme?

The Single Honours programme described in this document allows you to focus exclusively on this subject as part of a 480-credit Honours degree. It enables you to gain, and be able to demonstrate, a distinctive range of graduate attributes.

2. Overview of the Programme

The BSc (Hons) Bioengineering (Regenerative Medicine) programme is an innovative undergraduate programme that focuses on Bioengineering in the wider context of Regenerative Medicine. The programme aims to develop aspiring bioengineers into a specialised workforce that will respond to the future demands for regenerative therapeutic strategies. This programme will equip you with a transdisciplinary bioengineering know-how, laboratory skills and lexicon that will allow you to work on research, discovery and production of regenerative medicines.

In your first year, you will study fundamental aspects of cell and molecular biology, biochemistry, genetics, human physiology and anatomy and key concepts of bioengineering. In the second year, you will explore core elements of bioengineering including stem cell biology, cell biology for regenerative medicine, molecular biology and concepts in immunology. You will learn research analytical skills and have an introduction to pharmacology. In your third year you will study biomaterials and tissue engineering, molecular pharmacology, cancer biology, cell signalling, concepts in biotechnology and look at the current research topics in our field. In the fourth year you will study biomedical engineering, current good manufacturing processes, nanomedicine, study concepts in applied regenerative medicine, precision medicine, work to gain employability and communication skills and undertake an extensive research project.

During the first, second and third year of the programme you will acquire appropriate laboratory skills through sessions delivered in state-of-the-laboratories at the Metropolitan College site. These sessions provide a hands-on authentic experience of discipline appropriate laboratory skills. In your final year you will have the opportunity to utilise these skills within your final year research project (laboratory or computer based) to address research questions concerning human health and disease and the latest bioengineering strategies.

3. Aims of the programme

The Bioengineering (Regenerative Medicine) discipline integrates biochemical, molecular and cellular knowledge with engineering principles to design new types of advanced therapies to repair, replace and rejuvenate damaged or diseased tissues. While Cell Engineering looks at cell-related phenomena, Tissue Engineering covers a broad range of applications ranging from physiology to nanotechnology, from biochemistry to mechanobiology, placing more emphasis on the design of biocompatible scaffolds that promote desirable cell behaviour leading to replacement and remodelling of a whole tissue.

The broad aims of the BSc (Hons) Bioengineering (Regenerative Medicine) programme are to enable you to:

- develop a broad knowledge of molecular techniques and their applications to identify solutions for biological and medical problems.
- understand the critical potential of stem cells and reprogrammed pluripotent stem cells as pivotal source for engineered replacement of damaged tissues and cell therapies.
- learn the structural and mechanical properties of tissue to design optimised biocompatible materials that make possible the construction of engineered scaffolds for cells.
- acquire a range of graduate skills related to the research and commercial development of regenerative medicine products that should facilitate your postgraduate career.

4. What you will learn

The intended learning outcomes of the programme (what students should know, understand and be able to do at the end of the programme), can be described under the following headings:

- Subject knowledge and understanding

- Subject specific skills
- Key or transferable skills (including employability skills)

Subject knowledge and understanding

Successful students will be able to:

- K1 - describe the biochemical and molecular functions of cells and extracellular milieux;
- K2 - develop an understanding of the gross embryological, anatomical and physiological characteristics of the main systems of the human body;
- K3 - understand the sources and features of different types of human stem cells;
- K4 - evaluate the strategies to use stem cells as disease models and therapeutic tools;
- K5 - describe the physico-chemical properties of different biomaterials and nanomaterials that support tissue/organ growth, implantation and drug delivery;
- K6 - demonstrate familiarity with the concepts of genetic and genome engineering;
- K7 - discuss the concept of genomic medicine;
- K8 - understand core biological topics that underpin the study of pharmacology including: biochemistry, molecular biology, genetics, cell biology, physiology and anatomy, and their application to the development and pharmacology of acquired and inherited disease
- K9 - describe the principles that determine the three-dimensional structure of biological macromolecules (including nucleic acids, proteins and carbohydrates) and the application of this knowledge to rational drug design and ligand-target binding
- K10 - develop an understanding of signal transduction mechanisms of extra- and intra-cellular receptors in cell signalling pathways controlling cellular activities, with a focus on how these can be investigated experimentally and modified through relevant pharmacological approaches
- K11 - understand mechanisms of drug action in relevant tissues and organ systems, including the central nervous system, as well as drug toxicity and selective toxicity in the treatment of microbial infections and cancer
- K12 - describe the chemistry that underlies biological processes and their study, including chemical and thermodynamic principles applied to biochemical catalysis, the function of enzymes and other proteins, and the physicochemical properties of drug molecules including in context to pharmacokinetics and pharmacodynamics

Subject specific skills

Successful students will be able to:

- S1 - manage their own learning and utilise appropriate resources to the discipline;
- S2 - work safely and effectively in a scientific laboratory;
- S3 - collect, analyse and critically discuss scientific data relevant to the discipline;
- S4 - communicate confidently on topics related to the degree;
- S5 - understand the limits and ethical issues of the discipline and the need for codes of practice
- S6 - formulate hypotheses, design, plan, conduct, collate, analyse, report on and evaluate biological investigations
- S7 - apply scientific method, planning, and analytical skills to carry out a research project

Key or transferable skills (including employability skills)

Successful students will be able to:

- E1 - Effectively participate and work as a team or professional group.
- E2 - Constructively use feedback and take evidence-informed decisions.
- E3 - Identify and manage appropriate resources to solve problems.
- E4 - Confidently communicate information, ideas, problems and solutions to peers or professionals of the field of practice.
- E5 - Identify and work towards targets for personal, academic and career development
- E6 - Prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for presenting data visually

Keele Graduate Attributes

The Keele Graduate Attributes are the qualities (skills, values and mindsets) which you will have the opportunity to develop during your time at Metropolitan College Greece (MCG), through both the formal curriculum and also through co- and extra-curricular activities (e.g., engagements with the wider University community such as acting as ambassadors, volunteering, peer mentoring, student representation, membership and leadership of clubs and societies). Our Graduate Attributes consist of four themes: **academic expertise, professional**

skills, personal effectiveness, and social and ethical responsibility. You will have opportunities to engage actively with the range of attributes throughout your time at MCG: through your academic studies, where these attributes are embedded within your modules, through self-assessing your own strengths, weaknesses, and development needs, and by setting personal development goals. You will have opportunities to discuss your progress in developing graduate attributes with, for example, Academic Mentors, to prepare for your future career and lives beyond Keele.

5. How is the programme taught?

This Programme is delivered in Greek, with an emphasis on live, in-person, interactive sessions, supported by online materials on a VLE-Moodle allowing flexible engagement. Building on the expertise and experiences of staff and students, Metropolitan College Greece sets out a number of principles to ensure a high quality and engaging student experience. At the heart of the approach is 'active social learning', meaning that students are actively engaged in their learning both in person and online, learning through interaction and collaboration.

The key features of the University's approach are:

- Active social learning as a key principle
- Digital enhancement of learning
- Flexibility and responsiveness to students' learning and study needs
- Different and authentic assessment for learning
- Feedback that supports learning

Within this programme, there is a spiral curriculum developed at Keele University, that uses multiple forms of active learning including flipped-classrooms , audience response systems and technology enhanced learning complemented with authentic assessments and synoptic group tasks. Learning and teaching methods used on the programme vary according to the subject matter and level of the module. They include the following:

- Traditional lectures, workshops, science and computer laboratories (individual or in group), problem-based learning activities, journal clubs, virtual sessions.
- Seminars by scientists, clinicians or industry experts that are nationally and internationally recognised experts of the field.
- A research project (dissertation) that will expose the student to active research, supported by an experienced and active member of research staff.
- Digital resources: These include provision of short videos and directed reading, aligned with key learning outcomes and supporting campus-based lectures, tutorials and workshops focused on active learning through application of content as part of a 'flipped classroom' approach to delivery. This also gives you more flexibility to decide how, when and where to study, with the opportunity to submit questions based on the material anonymously in advance of taught sessions.

Apart from these formal activities, students are also provided with regular opportunities to talk through particular areas of difficulty, and any special learning needs they may have, with their Personal Academic Tutor or module lecturers on a one-to-one basis.

These learning and teaching methods enable students to achieve the learning outcomes of the programme in a variety of ways. For example:

- Lectures, workshops and virtual sessions expose students to the principles of Bioengineering and its related disciplines and give the opportunity to students to present their own ideas, discussing them with academics and their fellow students.
- Seminars, presentations and journal clubs allow students to gain knowledge from the most recent discoveries in Bioengineering, Cell and Tissue Engineering and Regenerative Medicine, asking questions about the subjects to experts of the field.
- Problem Based Learning sessions encourage students to critically consider the important challenges that scientists are facing in the field of Bioengineering to bring to the clinics novel experimental engineered tools.
- Laboratory sessions test practical skills, team working, organisational skills, initiative and expose students to some of the most used techniques relevant to biomedical discipline, Bioengineering and Regenerative Medicine.
- Research Projects help students to gain research experience by joining active research groups within Bioengineering related fields.

6. Teaching Staff

The programme of Bioengineering (Regenerative Medicine) has brought together expert bioengineers, pharmacists, material scientists and physicians to develop this research-led educative programme that will instruct students in the multiple aspects of translational medicine and Bioengineering. The programme will

provide an outstanding and inspiring environment for students, connecting them with research active academics and scholars that have world-leading expertise in the field of Bioengineering and Regenerative Medicine. The academic staff contributing to the programme will also include experts from multiple fields of expertise ranging from molecular biology to regenerative medicine with extensive expertise in teaching academic programmes. Many conduct highly interdisciplinary world-leading research on subjects related to the field of Bioengineering [Regenerative Medicine], or related disciplines, such as cancer biology, pharmacology and molecular biology, publishing in well recognized international scientific journals.

The University will attempt to minimise changes to our core teaching teams, however, delivery of the programme depends on having a sufficient number of staff with the relevant expertise to ensure that the programme is taught to the appropriate academic standard.

Staff turnover, for example where key members of staff leave, fall ill or go on research leave, may result in changes to the programme's content. The University will endeavour to ensure that any impact on students is limited if such changes occur.

7. Final and intermediate awards

Credits required for each level of academic award are as follows:

BSc (Hons) Bioengineering (Regenerative Medicine)	480 credits	You will require at least 480 credits across years 1, 2, 3, and 4. You must accumulate at least 120 credits in each of the four years of study, to graduate with a named single honours degree in this subject.
Diploma in Higher Education	240 credits	You will require at least 120 credits at level 4 or higher and at least 120 credits at year 2 or higher
Certificate in Higher Education	120 credits	You will require at least 120 credits at year 1 or higher

8. How is the Programme Assessed?

The wide variety of assessment methods used on this programme at Keele reflects the broad range of knowledge and skills that are developed as you progress through the degree programme. Teaching staff pay particular attention to specifying clear assessment criteria and providing timely, regular and constructive feedback that helps to clarify things you did not understand and helps you to improve your performance. The following list is representative of the variety of assessment methods used on your programme:

- Unseen Exam
- Laboratory Report
- Problem Based Studies (PBL)
- Dissertation
- Presentations
- Essays

Marks are awarded for summative assessments designed to assess your achievement of learning outcomes. You will also be assessed formatively to enable you to monitor your own progress and to assist staff in identifying and addressing any specific learning needs. Feedback, including guidance on how you can improve the quality of your work, is also provided on all summative assessments within three working weeks of submission, unless there are compelling circumstances that make this impossible, and more informally in the course of tutorial and seminar discussions.

9. Contact Time and Expected Workload

This contact time measure is intended to provide you with an indication of the type of activity you are likely to undertake during this programme. The data is compiled based on module diets of students on similar programmes in previous years. Every effort is made to ensure this data is a realistic representation of what you are likely to experience, but changes to programmes, teaching methods and assessment methods mean this data is representative and not specific.

The figure below is an example of activities that a student may expect on your chosen course by year stage of study. Contact time includes scheduled activities such as: lecture, seminar, tutorial, project supervision, demonstration, practical classes and labs, supervised time in labs/workshops. The figures are based on 1,200 hours of student effort each year for full-time students.

Activity

	Scheduled learning and teaching activities	Guided independent Study	Placements
Year 1 (Level 4)	37%	63%	0%
Year 2 (Level 5)	31.9%	68.1%	0%
Year 3 (Level 5)	30%	70%	0%
Year 4 (Level 6)	34.8%	65.3%	0%

10. Accreditation

This programme does not have accreditation from an external body.

11. University Regulations

The University Regulations form the framework for learning, teaching and assessment and other aspects of the student experience. Further information about the University Regulations can be found at: http://www.keele.ac.uk/student-agreement/

If this programme has any exemptions, variations or additions to the University Regulations these will be detailed in an Annex at the end of this document titled 'Programme-specific regulations'.

12. Additional Costs

Students are required to have appropriate PPE equipment such as laboratory coats and are expected to supply appropriate writing equipment such as pens, pencils, notebooks etc. Should further additional materials be required these will be clearly communicated in advance. Total estimated costs: £50

As to be expected there will be additional costs for inter-library loans and potential overdue library fines, print and graduation.

We do not anticipate any further costs for this programme.

13. Annex - Programme-specific regulations

Programme Regulations: BSc (Hons) Bioengineering (Regenerative Medicine)

Final Award and Award Titles	BSc (Hons) Bioengineering (Regenerative Medicine)
Intermediate Award(s)	Diploma in Higher Education Certificate in Higher Education
Last modified	June 2025
Programme Specification	https://www.keele.ac.uk/qa/programmespecifications

The University's Academic Regulations which can be found on the Keele University website (https://www.keele.ac.uk/regulations/)[1] apply to and regulate the programme, other than in instances where the specific programme regulations listed below over-ride them. These programme regulations list:

- *Exemptions* which are characterised by the omission of the relevant regulation.
- *Variations* which are characterised by the replacement of part of the regulation with alternative wording.
- *Additional Requirements* which set out what additional rules that apply to students in relation to this programme.

The following **exemptions, variations** and **additional requirements** to the University regulations have been checked by Academic Services and have been approved by the Faculty Education Committee.

A) EXEMPTIONS

The clause(s) listed below describe where an exemption from the University's Academic Regulations exists:

For the whole duration of their studies, students on this Programme are exempt from the following regulations:

- **No exemptions apply.**

B) VARIATIONS

The clause(s) listed below describe where a variation from the University's Academic Regulations exists:

Variation 1: Progression from Year 2 to Year 3

This programme varies from Regulation D2.

1.1 To apply a progression rule from Year 2 ('Level 5a') to Year 3 ('Level '5b') aligned with clause 1.2; i.e.:

- You can progress to Level 5b if you meet one of the following credit thresholds:
  - **(a)** You are awarded 120 credits at Level 4 and 120 credits at Level 5a; or
  - **(b)** You are awarded 120 credits at Level 4 and a minimum of 105 credits at Level 5a, provided you still have an assessment attempt remaining on any compulsory or optional module you have failed.
- You must be awarded credit for the module you have failed at Level 5a either over the summer reassessment period or whilst studying at Level 5b.

1.2 The remaining clauses in section 1.2 of Regulation D2 will apply with 'Level 5' relating to Level 5a (Year 2).

Variation 2: Condonement

This programme varies from Regulation D5.

2.1 Condonement can be applied to a maximum of 75 credits of modules, subject to the following rules:

- A maximum of 45 credits across Level 4 and Level 5 (i.e. Years 1-3), provided that no other modules have been failed at those levels of study
- A maximum of 30 credits of Level 6, provided that no other modules have been failed at that level of study.

Note: Award calculation

3.1 In accordance with Regulation D2, 1.3.1, it should be noted that the 120 Level 5 credits with the highest module marks across Years 2 and 3 will be used in the calculation process.

3.2 The 120 Level 5 credits constitute one third of the weighted average module mark with the remaining two thirds coming from the Level 6 average module mark.

Additional Requirements

The programme requirements listed below are in addition to the University's Academic Regulations:

Additional requirement 1: Attendance

Attendance at tutorials, seminars, workshops and laboratory sessions on this programme is compulsory. Failure to attend a class without good cause will result in an informal warning. Failure to attend any subsequent classes without good cause will lead to the issuing of a formal University warning in accordance with Regulation B8 and could result in the requirement to withdraw from the university.

Additional requirement 2: Self-Certification

Self-certification of illness as a reason for absence from compulsory classes will be accepted for no more than two periods of absence, each covering no more than 7 days, per semester. Any subsequent absence for reasons of illness must be accompanied by a medical certificate.

Additional requirement 3: Laboratory and tutorial classes

1. Wearing a laboratory coat is compulsory in all laboratories. Students will not be allowed to attend the laboratory class without a laboratory coat.

2. Students must wear appropriate clothing in the laboratories, including sensible footwear. Closed shoes and low heels should be worn. This is to avoid tripping and to protect the feet in the case of spillages. Long hair must be tied back. Students who are inappropriately dressed may, at the discretion of the member of staff in charge, be excluded from the class and recorded as being absent without good cause.
3. Students who arrive late to laboratory classes may, at the discretion of the member of staff in charge, be excluded from the class and recorded as being absent without good cause.
4. Students who display serious misconduct in any class may, at the discretion of the member of staff in charge, be excluded from the class and recorded as being absent without good cause. Serious misconduct involves willful damage to property, injury or threat to persons, or persistent disruption of teaching.
5. The unauthorised use of mobile phones or headphones is not permitted in any class.
6. Students are not permitted to record, video or photograph taught sessions or meetings with staff, except with the permission in advance of the staff concerned. Permission will be given where this is part of an approved disability adjustment. Any permission to record, video or photograph is for personal use only and all recordings, videos or photographs remain the property of the presenter and the University.

Additional requirement 4: Health and Safety

1. Students must strictly follow the regulations and the School's Health and Safety procedures.

_____

[1] References to University Regulations in this document apply to the content of the University's Regulatory Framework as set out on the University website here https://www.keele.ac.uk/regulations/.

Version History

This document

Date Approved: 08 August 2025

What's Changed

LSC-20141 Current Topics in Regenerative Medicine semester changed from 1-2 to Sem 2 (accidental error in first submission)

Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1	2025/26	ABIGAIL ROBERTS	07 July 2025	