PROGRAMME SPECIFICATION

KEY FACTS

Programme name	Biomedical and Healthcare Engineering Biomedical and Healthcare Engineering with Placement
Award	MEng (Hons)
School	Science & Technology
Department or equivalent	Engineering
UCAS Code	BH02 BH03
Programme code	USBIHE ENMEBHE01 USBHEP ENMEBE01
Type of study	Full Time
Total UK credits	480
Total ECTS	240

PROGRAMME SUMMARY

According to the EIT Biomedical Engineering is one of the top 5 fastest growing engineering fields. It is a cross-disciplinary field that combines medicine and biology with all or any of the most applied topics of chemistry, engineering, nanotechnology, and computer science. Biomedical engineers are at the forefront of scientific discovery, creating innovative medical devices for diagnosis and therapy, vaccines, disease management methods, robots, and algorithms that save lives and improve human health around the world. Also, in today's modern hospital the delivery of health care has become heavily dependent on complex engineering systems, thus the person best suited to assume the responsibility of these systems in terms of design, implementation, management, performance and safety in the health care environment is a professional biomedical engineer.

This is an interdisciplinary programme that brings together the School of Science and Technology together with the School of Health & Psychological Sciences.

During the degree, engineering knowledge is built-up and nurtured, with specific objectives associated with each component Programme Stages, whilst clinical and biosciences related subjects are delivered by experts in health sciences. Development of design skills and teamwork are at the heart of the City, University London engineering degrees throughout the programme.

Programme Stage 1 is primarily common across all of the engineering degrees with some small variation of the Biomedical and Healthcare Engineering programme where Anatomy and Physiology is taught exclusively for this cohort. This introductory year is intended to give you a thorough grounding in the fundamental and applied science and mathematics appropriate for an engineer, as well as developing personal skills such as time and quality management. Common to most stage 1 and 2 and across all Engineering programmes, you will be offered a core module termed as the Engineering in Society. During stage 1 this module will introduce the engineering discipline with particular emphasis on some key topics such as sustainability, the environment, healthcare, space, autonomous vehicles, etc. It will also incorporate personal tutoring and a series of seminars to improve your soft skills (presentations, CV building

employability skills, etc.). During the second year, the Engineering in Society module will focus on an introduction to engineering management and the circular economy. It will also incorporate training in employability and promote multi-skills engineering. This module during the first two stages will be assessed by both the lecturers and the personal tutors. In stage 3 and in stage 4, the same module (called Biomedical Engineering Practice in the Society) is still offered but will be tailored to the Biomedical and Healthcare engineering discipline. Particular emphasis will be given to an interdisciplinary approach to engineering, sustainability, societal and moral impact of engineering. Further help in building your curriculum and enhancing your employability potential will also be provided. At the end of Programme Stage 1 (assuming that you have met the academic requirements described below) you will have the opportunity to decide whether to remain on the MEng (Hons) Biomedical and Healthcare Engineering degree or switch to one of 6 other engineering MEng (Hons) degrees. This flexibility in choice at the end of Programme Stage 1 enables you to follow the discipline that best matches your strengths and most attracts you.

In Programme Stage 2 you will start to specialise and learn to apply engineering analysis to simple but representative components of engineering systems. You will further study biomedical design and given an engineering challenge, approaching a professional level exercise. You will also advance your knowledge of biomedical instrumentation, biomaterials, biomechanics and rehabilitation engineering, including a comprehensive module on electrophysiology & cardiorespiratory measurements. As with other years, a significant proportion of Programme Stage 3 is focused upon project design work. You will select one from a range of individual projects. It will be in Programme Stage 3 that you will be provided with a realistic biomedical engineering system design task, approaching a professional level exercise. This enables you to draw together and apply knowledge gained over a number of subject areas.

In Programme Stage 3 you also study specialist topics including biosignals, biosensors, medical physics and imaging, physiological fluid mechanics and biological system modelling. These modules involve looking at analysis in increasing depth alongside examining a greater breadth of the principles of physics and engineering applied to healthcare/medicine. The Engineering in Society module in Programme Stage 3 focus upon people and organisations, with case studies and invited lectures from industry professionals. At Programme Stages 3 you select one from a range of Level-7 individual research projects. In addition, at Stage 4, you undertake a major group design activity with a realistic task, approaching a professional level exercise, and Level-7 studies in neural engineering, wearable and implantable devices, and Healthcare App design in addition with two elective modules pertinent to the field of Biomedical and Healthcare Engineering.

If you wish to gain practical experience during your degree, then you have the option of spending 12 months on a paid industrial placement. This industrial placement can be taken either between Programme Stages 2 and 3 or between Programme Stages 3 and 4 or split them over two summers between the years of study. We strongly recommend this (see the subsequent section entitled ‘What Placement opportunities are available?’).

At the end of the programme, you will have acquired the knowledge and understanding of analysis and design techniques, practical and personal skills required for a career in biomedical and healthcare engineering. The Integrated Masters (MEng Honours) Programme develops you to a high level of professional as well as engineering competence, through broad engineering experience involving market analysis, commercial operational and regulatory constraints, project and team management, multi-disciplinary design and, where relevant, manufacture.

The MEng Honours Programme is a four-year, or five-year with placement, full time degree comprising 480 credits (4800 study hours) structured as four Programme Stages, each typically delivered over 22 contact weeks, 4 examination weeks, 4 reflective learning (private study) weeks and 8 vacation weeks (which may be used for private study) per academic year. MEng (Hons) Programme therefore requires a commitment of 40 study hours per week during the academic year.

Certificate of Higher Education
Upon successful completion of Programme Stage 1 you will be able to: (i) discuss underlying concepts and principles associated with fundamental science and technology, (ii) to develop skills in time and quality management and (iii) present, interpret and evaluate quantitative and qualitative data within your subject of study appropriate to the formation of an engineer. At this stage, having gained all the necessary credits, you will either: (i) automatically progress onto Programme Stage 2 of the MEng (Hons) in Biomedical and Healthcare Engineering or (ii) decide to switch onto one of 6 other MEng (Hons) engineering degrees (Mechanical and Design Engineering, Energy and Environmental Engineering, Aerospace Engineering, Civil and Infrastructure Engineering or Engineering with Business – note that the switch requires trailing one module form stage 1 in stage 2) or (iii) leave the University with a Certificate of Higher Education in Engineering.

Diploma of Higher Education
Upon successful completion of Programme Stage 2 you will have: (i) built upon your previous knowledge and experience, (ii) developed critical understanding of the well-established principles, and of the way in which those principles have developed in your area of study and (iii) advanced your skills of enquiry and different approaches to problem-solving as well as identify the limitations of your knowledge in your subject. At this stage, having gained all the necessary credits, you will either: (i) automatically progress onto Programme Stage 3 of the MEng (Hons) in Biomedical and Healthcare Engineering or (ii) leave the University with a Diploma of Higher Education in Biomedical and Healthcare Engineering.

BEng (Hons) Degree
Upon successful completion of Programme Stage 3 you will: (i) have developed a coherent systematic, detailed knowledge of your discipline and (ii) be able to confidently develop and employ appropriate techniques and methods in mathematical modelling and experimentation for engineering problem-solving, analysis and design. At this stage, having gained all the necessary credits, you will either: (i) automatically progress onto Programme Stage 4 of the MEng (Hons) in Biomedical and Healthcare Engineering or (ii) exit the University with a Bachelor of Engineering (Hons) degree provided all Stage 3 credits have been awarded for studies undertaken on the MEng degree programme or (iii) leave the University with a bachelors ordinary degree in Biomedical and Healthcare Engineering if you failed to gain sufficient credits for the award of a BEng (Hons) degree.

MEng (Hons) Degree
Upon successful completion of Programme Stage 4 (having gained all of the necessary credits) you will have met the requirements of the MEng (Hons) in Biomedical and Healthcare Engineering degree and will: (i) have developed an in-depth and comprehensive knowledge and understanding of biomedical engineering, (ii) be able to create, apply and synthesize techniques and methods in mathematical modelling and experimentation for problem-solving, analysis and design of a wide variety of biomedical engineering applications and situations, (iii) be able to develop originality in the application of knowledge

and techniques and advance scholarship in your area of study and (iv) be able to lead or participate in group design activities which mirror realistic engineering practices and situations.

Aims

The overall aim of the MEng (Hons) in Biomedical and Healthcare Engineering is to provide an excellent education in engineering with specialised training for a professional career in the industries underpinned by the biomedical engineering disciplines, including the relevant health sectors (i.e. NHS) or healthcare technologies industries. This will include the research, development, design, production, commissioning, operation and management aspects of those industries. In addition, students are expected to exercise leadership in project management and initiate independent research and critical analysis into specialized and advanced fields in engineering.

The programme is to produce graduates who:

- have a broad and in-depth knowledge and comprehensive understanding to solve a range of complex technical problems in biomedical engineering, scientific research, design environments and professional practice,
- are able to apply and integrate knowledge and understanding of other engineering disciplines to support their studies and research in biomedical engineering,
- are logical, creative, numerate, have a natural curiosity about the scientific world and are able to problem-seek as well as problem-solve,
- demonstrate an attention thoroughly to detail of current problems of their academic discipline, without losing sight of the overall picture,
- have a sound knowledge and understanding of business and management to participate effectively in teamwork and large commercial organisations,
- are aware of their professional practices and ethical responsibilities, the global and societal impact of engineering solutions, as well as the economic and political issues,
- are able to communicate effectively with full technical details to a wide range of audiences,
- exhibit team loyalty and have the ability and confidence to be a leader in industry,
- are able to undertake postgraduate level study to advance their knowledge and understanding, and to develop new skills in engineering with minimum supervision.

WHAT WILL I BE EXPECTED TO ACHIEVE?

This programme has been developed in accordance with the QAA Subject Benchmark for Engineering to demonstrate the engineering and professional learning outcomes listed in this section. Learning outcomes which must be delivered by MEng Programmes, accredited by Professional Engineering Institutions as meeting the educational requirements for registration as a Chartered Engineer, are defined in general terms in the 4th edition of the Accreditation of Higher Education Programmes, published at www.engc.org.uk. The programme learning outcomes listed below are accordingly all cross-referenced to these mandated AHEP4 learning outcomes as numbered in Appendix A to the Engineering Accreditation Board Form ACC2.

On successful completion of this programme, you will be expected to be able to:

Knowledge and understanding:

- Explain and develop the scientific principles upon which biomedical engineering is based, including those which underpin current technological advances in the sector (M1).

- Analyse and solve different biomedical engineering problems using advanced MEng level knowledge and understanding of a range of mathematical and computational models (M2).
- Apply a diverse set of engineering techniques and practices to conceptualise, design, build and test processes, including customer requirements, dependencies, assumptions, constraints, uncertainties and creative solutions to problems; also, with recent or planned developments in practice (M5, M6, M7, M9, M12, M13).
- Apply practical experience of the concept of fitness for purpose and the separate consideration of innovative design for production, operation, maintenance and disposal of an engineering system to meet future needs (M5, M6, M7, M12).
- Apply practical experience of the multi-disciplinary character of engineering and making sound and clear decisions based upon social, environmental/sustainable development, ethical, legal, economic and commercial considerations (M7, M8, M15).
- Conform with current technological and manufacturing/operational practice in the engineering and healthcare industry and with future trends in relevant areas (M4, M7, M13).
- Implement fully the concepts from outside engineering which nonetheless drive engineering practice and business development (M5, M13).
- Apply fully the broad range of management tools and techniques required to create and run an engineering business (M9, M10, M14, M15).
- Apply the extended knowledge and understanding expected from MEng level, of the type described above, specific to the principles and practice of biomedical/healthcare and to biomedical design, manufacture, operation and maintenance and extensive awareness of developments in the field (M5, M6, M12, M13).
- Assess and predict the biomedical/healthcare engineering industry as a business enterprise in national and international economies (M5).

Skills:

- Tackle confidently unfamiliar engineering problems (M18).
- Gather, integrate and evaluate information from various sources including technical and medical literature (M4).
- Break down a problem into a series of engineering tasks to be solved under a set of multi-disciplinary constraints (M5).
- Communicate effectively in technical and non-technical languages, written, oral and graphical forms to individuals and large audiences (M17).
- Use laboratory equipment for data measurement, processing, interpreting and analysis (M3, M13).
- Use workshop equipment to produce or modify an engineering component (M12).
- Be proficient with analytical, computational and experimental techniques (including assessing the limitations of the results obtained), coupled with experience and decision-making, to solve engineering problems (M2, M3).
- Apply initiative, creativity and innovation to design, construct and test a system, component or process to meet specifications (M5).
- Evaluate designs, processes or products and make improvements, taking into consideration associated commercial risks, health, societal and environmental impact (M7, M9, M10).
- Work with technical uncertainty (M13).

- Work with levels of detail appropriate to the criticality of the task (M5).
- Plan for and manage time/cost/quality of an engineering project and, where necessary, use theory or experimental research to mitigate deficiencies, including adjusting plans to changing circumstances and controlling such adjustments (M7, M9, M10).
- Exercise leadership through individual and/or team exercises (M14, M15). Willingly take the lead in difficult situations (M16).
- Be proficient in the application of analytical, computational and CAD techniques specifically to the analysis and design of different biomedical systems (M3, M17).

Values and attitudes:

- Put the needs of the team ahead of one's own needs (M16).
- Willingly take on the professional and ethical responsibilities of engineers in society (M8); commit to continuous improvement to enhance professional skills and benefit society (M18).
- Willingly take the lead in difficult situations (M16).
- Value the impact of biomedical engineering to society and to the global economy (M7) while recognising the need for biomedical/healthcare engineering industry to contribute in a sustainable way (M7).
- Recognise that there is only one type of engineer, a person that tackles and solves problems, independently of gender, religion or race. Our graduates will be aware of the social and moral importance of equality and diversity, and of promoting inclusion (M11).

HOW WILL I LEARN?

Contact hours are made up of: lectures, which direct you towards the most important topics in the field and which allow discussion and clarification of areas of uncertainty with expert staff; tutorials where staff are on hand to help with problem-solving exercises; laboratory and workshop classes where practical situations and methods are encountered; and research or design/build projects, both individually and in groups, where personal skills, teamwork, creativity and critical thinking are developed and where knowledge built up elsewhere in the programme is integrated and developed. Site visits are used to place taught sessions in the context of real-world industries or products.

Engineering is a practical discipline which benefits from significant supervised study, but it cannot be learnt through lectures alone. In Programme Stages 1 and 2 there is a higher proportion of supervised study (compared with Programme Stages 3 and 4), with typically 20-24 hours of contact timetabled each week. These supervised contact hours are designed to assist and to focus your private study. Teaching involves a combination of theoretical, experimental and computational study. Our approach is to encourage critical thinking and foster your curiosity. The majority of learning in Higher Education is typically conducted through private study, therefore by the time that you reach Programme Stage 3, the tutorial and practical elements are managed more by you, especially in relation to your individual project work. In Programme Stage 4 the MEng Project gives you an opportunity to work independently, under the guidance of a member of staff, to undertake research into a topic that you may not have covered in taught material. You will have the opportunity to apply your knowledge and understanding to the solution of engineering problems, in topics related to biomedical and healthcare engineering.

The remaining hours of private study each week are essential to the achievement of the

learning outcomes and are guided using both formative and summative coursework tasks set during the academic year. Your private study is also supported by the use of Moodle, City's Online Learning Environment. This provides online access to module content, feedback, guidance on completing coursework, audio-visual resources, etc.

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessment and Assessment Criteria

The Programme is subdivided into Programme Stages (years of study) and each Programme Stage into modules (coherent groupings of syllabus topics addressing particular Learning Outcome types). Each module in the programme may have one or more assessment components of differing types, for example in a typical 15 credit module taking place over one semester you may be expected to complete one large piece of work, based on conducting your own research and independent study, or complete a few smaller pieces of work that take the form of class quizzes, performing laboratory experiments, submitting engineering-style designs, sitting formal exams or a combination of some or all the above. Assessment components may involve more than one assessment task (e.g., they may be an aggregate of different coursework marks or multiple examination papers). Modules that contain multiple assessment components (either coursework or exam) for which individual minimum pass marks are required are specified in the relevant module specifications.

Some modules will have an examination component in addition to a coursework (continuous assessment) component. Many skills need to be honed by practice: to this end formative assessments, may be organised within each module with appropriate and timely feedback mechanisms.

Examinations are used because they provide a controlled environment in which to assess knowledge and understanding and problem-solving skills. The time pressure and lack of prior warning about specific issues to be tackled is representative of real-world situations faced by practicing engineers. Coursework assessments vary from paper assignments (which may be similar to examinations but with longer time scales and with access permitted to information sources) to the assessment of practical skills which cannot be done in the exam hall. For example, communication skills (e.g., presentations, drawings and written reports), personal skills (such as teamwork or leadership), planning and design (both software and hardware), data analysis, critical review of information and the use of workbench and CAE tools are usually assessed by means of coursework tasks.

Often coursework tasks may be set which are not to be assessed but which are valuable as a learning experience. This is known as formative coursework and is often the key to improving grades on assessed or summative coursework. You will receive feedback from all coursework assessments, both formative and summative, to enable you to develop and enhance your assessment performance.

Assessment Criteria are descriptions, based on the intended learning outcomes, of the skills, knowledge or attitudes that you need to demonstrate in order to complete an assessment successfully, providing a mechanism by which the quality of an assessment can be measured. Grade-Related Criteria are descriptions of the level of skills, knowledge or attributes that you need to demonstrate in order achieve a certain grade or mark in an assessment, providing a mechanism by which the quality of an assessment can be measured and placed within the overall set of marks. Assessment Criteria and Grade-Related Criteria will be made available to you to support you in completing assessments. These may be provided in programme handbooks, module specifications, on the virtual learning environment or attached to a specific assessment task.

Feedback on assessment

Feedback will be provided in line with our Assessment and Feedback Policy. In particular, you will normally be provided with feedback within three weeks of the submission deadline or assessment date. This may be written (on the hard copies and online) or oral (in class), specific to you or generally applicable, and would normally include a provisional grade or mark. If the coursework submitted is a laboratory report, then your work will not be returned until three weeks after the last report has been submitted. Laboratories are undertaken by groups of you in rotation over periods of many weeks and consequently the last group of you may complete the laboratory and submit the report many weeks after the first group.

For end-of-module examinations or an equivalent significant task (e.g., an end-of-module project), a generic feedback will normally be provided within four weeks of the last day of exam period. The timescale for feedback on final year projects or dissertations may be longer and starts from the date of the final presentation of the project. The full policy can be found at: https://www.city.ac.uk/__data/assets/pdf_file/0009/452565/Assessment-and-Feedback-Policy...pdf

Assessment Regulations

In order to pass your programme, you should complete successfully (or be exempted from) the relevant modules and assessments and will therefore acquire the required number of credits. You also need to pass each preceding Programme Stage of your Programme in order to progress to the following Programme Stage.

Your overall aggregate mark will be calculated by combining the aggregate marks from Programme Stages 1, 2, 3 and 4 in the ratio 1:2:3:4.

The pass mark for each module is 40%, except for Level-7 modules where the pass mark is 50%. In some modules there will be a requirement to pass individual components of the module (where the pass mark for these components will also be 40%, or 50% for Level-7 modules). Details of which assessment components need to be passed individually is provided in the Module Specification.

If you fail an assessment component or a module, the following will apply.

1. *Compensation*: where, if you fail no more than one sixth of the total credits at first or resit attempt, you may be allowed compensation if

- Compensation is permitted for the module involved (see the What will I study section of the Programme Specification), and
- it can be demonstrated that you have satisfied the Learning Outcomes of the modules in the Programme Stage, and
- a minimum overall mark of at least 30% has been achieved in the module to be compensated (40% for Level 7 modules), and
- an aggregate mark of at least 40% (50% for Programme Stage 4) has been achieved for the Programme Stage under consideration.

Where you are eligible for compensation at the first attempt, this will be applied in the first instance rather than offering a resit opportunity.

If you receive a compensated pass in a module then you will be awarded the full 15 credits for that module. The original component marks will be retained in the record of marks and your original module mark will be used for the purpose of your Award calculation.

Note that the total amount of compensated credits cannot exceed 30 during your whole study degree.

2. *Resit*: Where you are not eligible for compensation at the first attempt, you will normally be offered one resit attempt.

If you are successful in the resit, you will be awarded the full credit for that module. The mark for each assessment component that is subject to a resit will be capped at the pass mark for the module. This capped mark will be used in the calculation of the final module mark together with the original marks for the components that you passed at first attempt.

If you do not meet the pass requirements for a module and do not complete your resit by the date specified, you will not progress to the next Programme Stage and the Assessment Board will require you to be withdrawn from the Programme.

If you fail to meet the requirements for a particular Programme Stage or the Programme, the Assessment Board will consider whether you are eligible for an Exit Award as per the tables shown below.

If you would like further information about the way in which assessment works at City, please see the full version of the Assessment Regulations at: https://www.city.ac.uk/__data/assets/pdf_file/0007/453652/s19.pdf

WHAT AWARD CAN I GET?

Integrated Masters degree with honours in Biomedical and Healthcare Engineering

Programme Stage	HE Level	Credits	Weighting %
1	4	120	10
2	5	120	20
3	6	120	30
4	7	120	40

Class	% Required
I	70
II upper division	60
II lower division	50

Bachelor's degree with honours in Biomedical and Healthcare Engineering

Programme Stage	HE Level	Credits	Weighting %
1	4	120	10
2	5	120	30

Class	% Required
I	70
II upper division	60

3	6	120	60	II lower division	50
				III	40

Ordinary degree in Biomedical and Healthcare Engineering

Programme Stage	HE Level	Credits	Weighting %
1	4	120	10
2	5	120	30
3	6	60	60

Class	% Required
With Distinction	70
With Merit	60
Without Classification	40

Diploma of Higher Education in Biomedical and Healthcare Engineering

Programme Stage	HE Level	Credits	Weighting %
1	4	120	25
2	5	120	75

Class	% Required
With Distinction	70
With Merit	60
Without Classification	40

Certificate of Higher Education in Engineering

Programme Stage	HE Level	Credits	Weighting %
1	4	120	100

Class	% Required
With Distinction	70
With Merit	60
Without Classification	40

WHAT WILL I STUDY?

Programme Stage 1
Programme Stage 1 comprises eight core Level-4 modules, totalling 120 credits. To pass Stage 1 you must obtain all 120 credits, as specified in the Programme Scheme.

Module Title	SITS Code	Module Credits	Core or Elective	Can module be compensated?	Level
The Engineering in Society - Social Responsibility	EG1000	15	Core	No	4
Anatomy and Physiology	EG1400	15	Core	No	4
Introductory Mathematics and Programming	EG1006	15	Core	No	4
Electronics I	EG1005	15	Core	No	4
Engineering Science	EG1003	15	Core	No	4
Mathematics I	EG1001	15	Core	No	4
Introduction to Thermodynamics and Fluid Mechanics	EG1008	15	Core	No	4
Engineering Design I	EG1002	15	Core	No	4

Programme Stage 2
Programme Stage 2 comprises eight core Level-5 modules, totalling 120 credits. To pass Programme Stage 2 you must obtain all 120 credits, as specified in the Programme Scheme.

If you wish to gain practical experience you have the option of spending a year on paid industrial placement between Programme Stages 2 and 3. You also have the option to split the placement over two periods in the summer between the years of study.

Module Title	SITS Code	Module Credits	Core or Elective	Can module be compensated?	Level

The Engineer in Society: Sustainability and Circular Economy	EG2000	15	Core	No	5
Mathematics - II	EG2001	15	Core	No	5
Engineering Design II	EG2400	15	Core	No	5
Biomedical Instrumentation	EG2403	15	Core	No	5
Data Analysis for Engineers	EG2002	15	Core	No	5
Biomaterials	EG2401	15	Core	No	5
Biomechanics and Rehabilitation Technology	EG2402	15	Core	No	5
Electrophysiology and Cardiorespiratory Measurements	EG2404	15	Core	No	5

To continue to Programme Stage 3 of the MEng Programme, you must have achieved a module average of at least 50% at the end of Programme Stage 2. If you fail to meet the requirement to progress to MEng Programme Stage 3, but pass all modules in Programme Stage 2, then you will be allowed to progress to Programme Stage 3 of the BEng Programme.

Programme Stage 3

Programme Stage 3 comprises seven core Level-6 modules, totalling 120 credits. To pass Programme Stage 3 you must obtain all 120 credits, as specified in the Programme Scheme.

If you wish to gain practical experience you have the option of spending a year on paid industrial placement between Programme Stages 3 and 4, if not taken between Programme Stages 2 and 3.

Module Title	**SITS Code**	**Module Credits**	**Core or Elective**	**Can module be compensated?**	**Level**
Individual project	EG3000	30	Core	No	6
The Engineer in Society – Healthcare for all	EG4400	15	Core	Yes	6
Biomedical Signal Processing	EG3404	15	Core	Yes	6
Biomedical Sensors	EG3405	15	Core	Yes	6
Biological Systems Modelling	EG3401	15	Core	Yes	6
Medical Physics and Imaging	EG3403	15	Core	Yes	6
Physiological Fluid Mechanics	EG3402	15	Core	Yes	6

Having exhausted all re-sit opportunities, if you fail to progress to MEng Programme Stage 4, then you will be transferred to the BEng programme and considered for the award of a BEng (Hons) Degree.

Programme Stage 4

Programme Stage 4 comprises five compulsory Level-7 modules, totalling 90 credits, and two elective Level-7 modules of 15 credits. To pass Programme Stage 4 you must obtain 120 credits, as specified in the Programme Scheme.

Module Title	SITS Code	Module Credits	Core or Elective	Can module be compensated?	Level
Design Group Project – Biomedical	EG4401	30	Core	No	7
The Engineering in Society - Biomedical Engineers	EG4400	15	Core	Yes	7
Healthcare App Design	EG4402	15	Core	Yes	7
Wearable and Implantable Devices	EG4404	15	Core	Yes	7
Neural Engineering	EG4403	15	Core	Yes	7
Medical Device Entrepreneurship	EG4405	15	Elective	Yes	7
Ethics and Biodata Management and Security	EG4406	15	Elective	Yes	7
Robotics Imaging and Vision	EG4302	15	Elective	Yes	7
Machine Learning	EG4304	15	Elective	Yes	7

TO WHAT KIND OF CAREER MIGHT I GO ON?

In today's modern hospital, the delivery of healthcare has become heavily dependent upon complex engineering systems. Thus, the person best suited to assume responsibility of these systems, in terms of design, implementation, management, performance and safety in the healthcare environment, is a professional Biomedical engineer. Biomedical engineering is an area that is continually growing and the demand for biomedical engineers is increasing rapidly. The sector depends greatly upon engineers who are skilled in the design and operation of healthcare technologies used for applications across a wide spectrum of societal needs, including breakthroughs in diagnosis, monitoring, treatment and prevention of disease. Graduate biomedical engineers will be able to seek employment in the medical technology industry, the pharmaceutical industry, NHS and private hospitals, government (Department of Health) and other health related departments and organisations.

Recent graduates have joined employers such as major hospitals of the NHS and overseas, Philips Healthcare, Covidien, Siemens, Astra-Zeneca, Draeger, GE Healthcare and many other small and medium-sized companies innovating technologies relating to healthcare.

Through the various career choices graduates will also have the opportunity to apply and work towards chartered engineering status through CPD training, with our accrediting bodies, The IET and IPEM furthering their career opportunities and progression. See the Professional recognition section below.

The Centre for Career & Skills Development provides a service to current undergraduates and postgraduates, as well as recent graduates of the University. Their aim is to provide you with advice, information, and skills that you need to make a smooth transition into the world of professional engineering. If you would like further information on the careers support available at City, please go to: http://www.city.ac.uk/careers

WHAT STUDY ABROAD OPTIONS ARE AVAILABLE?

At present these options are not available; they remain under development.

WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?

If you wish to take a professional placement, then you will need to register accordingly prior to the start of your placement. We strongly encourage you to undertake a 12-month placement or 6–8-week Summer Internship, as you will benefit greatly from the experience; providing you with a distinct advantage when you seek employment upon graduation. SMCSE's Professional Liaison Unit (PLU) collaborates with the University Career and Skills Development Service to deliver a series of Professional Development workshops during Period 1 of Programme Stage 3 to prepare you for searching for and applying for a work placement. The PLU is in regular contact with companies and other organisations concerning the availability of training opportunities and will advise you on making applications.

You are welcome to make your own applications, but you will be asked to discuss these with the PLU's Work Based Learning Advisor. Support is provided in the SMCSE Placement & Internships Resource Centre module on Moodle.

If you are on an approved Professional Placement, then your experience will be graded on the basis of (i) reports from two visits made by the Visiting Tutor (a member of academic staff) familiar to the subject and (ii) your final report. Informal contact is maintained throughout the 12 months, as necessary. Although your placement is reported on the degree transcript, the grading does not contribute to the final degree result.

Placement guidelines are issued to you and your employer at the commencement of training, and these include a placement health and safety booklet. The guidelines also include a section on workplace learning. Early in the placement year, you are required to produce a placement plan in conjunction with your Workplace Supervisor and the Visiting Tutor.

WILL I GET ANY PROFESSIONAL RECOGNITION?

Accrediting Body(s): Institution of Engineering Technology (IET), Institute of Physics and Engineering in Medicine (IPEM)

Nature of Accreditation

Our current Biomedical Engineering degrees are accredited by the above institutions, providing a path for students on those programmes to gain Chartered Engineering status. This programme has been designed to satisfy the above institutions' accreditation criteria and an application for accreditation will be made in due course. We have every expectation that these degrees will similarly receive full accreditation.

HOW DO I ENTER THE PROGRAMME?

The following entrance requirements typically apply.

UCAS tariff points

128.

A-levels

ABB; including A-Level in either mathematics or physics or other two sciences and a GCSE science. You are also required to have passed GCSE English Language at grade 4, or higher.

IB

31 points with 'Higher-Level Mathematics/Physics/Biology/Chemistry at grade 5'.

BTEC

BTEC (Level 3 Nationals only).

D*DD in Engineering (RQF) (First teaching Sept 2016). Candidates must also have a minimum of grade 6 in GCSE Mathematics and Science/Physics.

English language requirements

For overseas candidates, an IELTS score of 6.0 (with a minimum of 5.5 in all components) is required. TOEFL is not accepted as evidence of English language ability for students that require a Confirmation of Acceptance for Studies.

Entry via Foundation Course

You will be offered a place on the MEng (Hons) degree in Biomedical Engineering should you both (i) successfully satisfy the City University London interview panel and (ii) obtain an overall grade of at least 75% on an Engineering Foundation programme at: City and Islington College, INTO City University London International or Kaplan International College.

RPL/RPEL

Direct entry into Programme Stage 2 may be considered for candidates who have successfully completed the first year of a similar accredited MEng or BEng degree.

Scholarships
Undergraduate students are considered for a wide range of awards (scholarships, bursaries and prizes) throughout their studies in the School. These (internally and externally funded) awards range from £500-£9,000 and they are based on a combination of academic merit and hardship. A number of these awards are also available to international students. Further information can be found at: http://www.city.ac.uk/study/undergraduate/funding-and-financial-support/scholarships-and-bursaries

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