**Merger with City, University of London**

City, University of London and St George's, University of London have signed an agreement to merge. Subject to the necessary regulatory approvals, the merged institution will be called City St George's, University of London and will begin operating from 1 August 2024.

For students joining in 2024, there will be no change to the delivery, content and structure of the course. St George's will be going through the process to enable it to offer students the choice to still graduate with a St George's Hospital Medical School degree certificate or choose to graduate with a degree certificate from City St George's.

Further information, including frequently asked questions and contact details to submit further questions, are available on our website: https://www.sgul.ac.uk/study/prospective-students/merger


# Programme Specification

| A | NATURE OF THE AWARD | |
|---|---|---|
| 1 | Programme Title | Biomedical Science |
| 2 | Final award | MSci (Hons) |
| 3 | Intermediate awards | Undergraduate Certificate in Biomedical Science<br>Undergraduate Diploma in Biomedical Science<br>BSc (Hons) Science of Biomedicine |
| 4 | Awarding institution/body | St George's Hospital Medical School, a constituent college of the University of London |
| 5 | Teaching institution | St George's, University of London |
| 6 | Programme accredited by | N/A |
| 7 | UCAS/JACS code | B942 |
| 8 | QAA benchmark statements | QAA National Qualifications Framework<br>QAA Guidance on Master's Degree Characteristics<br>Biomedical Science and Biosciences 2015 |
| 9 | Date specification produced | March 2024 |

| B | FEATURES OF THE PROGRAMME | |
|---|---|---|
| 1 | Mode of study | Full-time |
| 2 | Usual length of programme | 4 years |
| 3 | Other features of the programme | Opportunity to undertake research project at a partner institution under the 'Mobility for Traineeships' Erasmus+ or Turning schemes.<br><br>The standard degree award title is MSci (Hons) Biomedical Science. |

| C | EDUCATIONAL AIMS OF THE PROGRAMME |
|---|---|

The programme aims to recruit students who are committed to a career in science. The programme enables students to acquire higher level knowledge in selected disciplines aligned to the research strengths of the university and gain additional practical experience in preparation for a research-based career.

- To provide a progressive and integrated programme of study that enables students to understand and achieve a scientific approach, in the biomedical sciences, across a variety of related disciplines, and enhance their specialist knowledge in selected areas.
- To produce graduates who have core knowledge and understanding over a range of subject areas, and in-depth advanced knowledge and understanding of selected areas of the biomedical sciences at the forefront of the discipline.
- To develop students with a critical appreciation of the existing knowledge of subjects and enable students to develop and supplement that knowledge by formulating and implementing effective research strategies.
- To produce graduates who have well developed practical skills, with the knowledge and understanding underpinning such methods, and the ability to analyse investigations.
- To produce graduates who are able to design and conduct experiments to test a hypothesis.
- To produce graduates who are capable of working independently in the laboratory to undertake a research project.
- To provide students with enhanced experience and key skills (critical, analytical, problem-based) transferable to employment or further study.

The aims of Year 1 and 2 are:

- To provide an introduction of a broad range of topics common to the education of students studying in a variety of health-related degree programmes.
- To provide students with a basic knowledge and understanding of cellular, molecular and medical sciences, including normal functioning of the human body as well as disease processes and therapies used to treat diseases.
- To gain insight into scientific method and to provide an understanding of various methods used in biomedical research and diagnostic laboratories and how these techniques have advanced scientific knowledge and understanding as well as improving diagnoses underpinning detection and treatment of diseases.
- To allow students to develop independent study skills, including undertaking a literature review, critically appraising published work, and presenting a written project in which these skills are brought together.

The aims of the Year 3 Taught Modules are:

- To impart knowledge on specialist topics in depth.
- To develop students' critical skills, training in the analysis of published data and the conclusions drawn from it, and the presentation of sufficient information to enable students to see the directions in which fields are developing.

The aims of the Core Research Modules in Year 3 and 4 are:

- To enable students to rationally design experiments and to critically analyse data in a variety of formats
- To provide quantitative and qualitative approaches to research
- To prepare students for an extended research project in Year 4
- To prepare students for more extensive research in Year 4
- To provide experience and insight into the development of a research hypothesis
- To compose research aims and generate a scientific research proposal

The aims of the Year 4 Research Project are:

- To provide a practical opportunity for students to further develop their research skills
- To enable students to undertake a piece of original research under supervision.
- To impart the ability to plan experiments and to interpret the data obtained from them.
- To give students training in the analysis of their results in relation to recent research developments in their chosen area of research.
- To provide experience in traditional research communication formats

| D | LEARNING OUTCOMES OF THE PROGRAMME | |
|---|---|---|
| ***Advanced knowledge and understanding of:*** | | ***Indicative teaching and learning methods*** |
| **1** | Normal functioning of the human body | - Lectures<br>- Small group tutorials<br>- Scenario based learning<br>- Dissecting Room teaching<br>- Laboratory practicals<br>- IT based learning |
| **2** | Abnormal process causing disease | |

| | | |
|---|---|---|
| 3 | Therapies used to treat diseases | - Peer presentations<br>- Self-directed learning (facilitated by worksheets, textbooks and on-line resources)<br>- Literature review<br>- Independent study<br>- Research project; training in a research laboratory<br><br>*Indicative assessment methods*<br>- Essays<br>- Posters<br>- Literature review<br>- Student presentations<br>- Written examinations which may incorporate essays, SBAs, LAQs and SAQs<br>- OSPE<br>- Research Project dissertation<br>- Reflective writing |
| 4 | Skills required for critical evaluation of scientific/clinical research | |
| 5 | Application of scientific principles to medicine, medical research and diagnosis | |
| 6 | In depth appreciation and analysis of specific fields of research | |
| 7 | Potential impact of current developments | |

| *Cognitive skills: the ability to* | | |
|---|---|---|
| 1 | Understand the different approaches to research methods | *Indicative teaching and learning methods*<br>- Lectures<br>- Small group tutorials<br>- Scenario based learning<br>- Dissecting Room teaching<br>- Laboratory practicals<br>- IT based learning<br>- Peer presentations<br>- Self-directed learning (facilitated by worksheets, textbooks and on-line resources)<br>- Literature review<br>- Independent study<br>- Research project; training in a research laboratory<br><br>*Indicative assessment methods*<br>- Essays<br>- Posters<br>- Literature review<br>- Student presentations<br>- Written examinations which may incorporate essays, SBAs, LAQs and SAQs<br>- OSPE<br>- Research Project dissertation<br>- Reflective writing |
| 2 | Evaluate scientific methodology and data and formulate hypotheses based on existing evidence | |
| 3 | Analyse and interpret data | |
| 4 | Review scientific and clinical data | |

| *Practical skills: the ability to* | | |
|---|---|---|
| 1 | Use IT for library searches and information retrieval | *Indicative teaching and learning methods*<br>- Lectures<br>- Small group tutorials<br>- Scenario based learning<br>- Dissecting Room teaching<br>- Laboratory practicals<br>- IT based learning<br>- Peer presentations<br>- Self-directed learning (facilitated by worksheets, textbooks and on-line resources)<br>- Literature review<br>- Independent study<br>- Research project; training in a research laboratory<br><br>*Indicative assessment methods*<br>- Essays<br>- Posters |
| 2 | Undertake computer analysis of data and data presentation | |
| 3 | Give oral presentations of scientific experiments/case reports or overviews of a detailed scientific topic | |
| 4 | Perform advanced technical laboratory skills | |
| 5 | Write clearly and concisely – e.g. scientific reports, reviews of scientific literature and examination essays | |

| | | |
|---|---|---|
| 6 | Interpret data as a basis for scientific and clinical research | - Literature review<br>- Student presentations<br>- Written examinations which may incorporate essays, SBAs, LAQs and SAQs<br>- OSPE<br>- Research Project dissertation<br>- Reflective writing<br>- Laboratory notebook/journal keeping |
| 7 | Plan and carry out an individual research project, understand the legal and ethical frameworks, evaluate research outcomes, and relate them to the existing knowledge base | |

| *Transferable skills: the ability to* | | *Indicative teaching and learning methods*<br>- Lectures<br>- Small group tutorials<br>- Scenario based learning<br>- Laboratory practicals<br>- IT based learning<br>- Peer presentations<br>- Self-directed learning (facilitated by worksheets, textbooks and on-line resources)<br>- Literature review<br>- Independent study<br>- Research project; training in a research laboratory<br>- Personal tutor-tutee meetings / Academic & Professional portfolio<br><br>*Indicative assessment methods*<br>- Essays<br>- Posters<br>- Literature review<br>- Student presentations<br>- Written examinations which may incorporate essays, SBAs, LAQs and SAQs<br>- OSPE<br>- Research Project dissertation<br>- Reflective writing |
|---|---|---|
| 1 | Structure and communicate ideas both orally and in writing | |
| 2 | Assess evidence critically | |
| 3 | Find and use information technology | |
| 4 | Initiate independent laboratory and library research and to evaluate such research | |
| 5 | The ability to set independent learning objectives beyond those established in the teaching room | |
| 6 | Reflect on academic experience, in terms of both scientific progress and personal development | |

## E PROGRAMME STRUCTURES AND FEATURES

The MSci Biomedical Science degree is a four-year modular programme of study. The first two years of the programme are identical to the BSc Biomedical Science programme. In Year 3, MSci students undertake compulsory modules to the value of 45 credits and select a 75-credit pathway from a range of options. The broad range of Year 3 module study options allow students to focus on subjects of particular interest and maximise career choices. The compulsory 'Biomedical Research Techniques for Drug Development' module provides knowledge of current translational biomedical research techniques, cellular physiology, in vitro and in vivo physiology, pharmacology, and drug development. The compulsory research skills modules (Structured Research Project and Experimental Design and Data Analysis) provide practical preparation for the Year 4 research project.

Valued at 105 credits, the Research Project is an important part of the final year. It enables students to carry out and present a defined piece of research and is supervised by academic and research staff within St George's research laboratories. Project work is further supported by a compulsory 15-credit research skills module (Research Proposal). The overall composition of the course is as follows:

**Year 1 (compulsory Level 4 modules)**

*Semester 1*
Fundamentals of the Living Cell (30 credits)
Fundamentals of Pathology (10 credits)
Fundamentals in Physiology & Pharmacology (15 credits)

*Semester 2*
Physiology 1 (40 credits)
Anatomy 1 (15 credits)

*Semesters 1 & 2*
Personal & Academic Skills 1&2 (10 credits)

**Year 2 (compulsory Level 5 modules)**

*Semester 3*
Genomics (10 credits)
Physiology 2 (20 credits)
Anatomy 2 (15 credits)

*Semester 4*
Microbiology and Immunology (25 credits)
Molecular Basis of Disease (25 credits)

*Semesters 3 & 4*
Personal & Academic Skills 3&4 (25 credits)

**Year 3 (Level 6 modules)**
(*N.B. Available optional modules are subject to change each year*).

**Compulsory 15 credit modules**
Biomedical Research Techniques for Drug Development
Experimental Design and Data Analysis
Structured Research Project

**Optional 30-credit modules:**
Biology of Cancer
Cardiovascular & Respiratory Diseases
Cell & Molecular Biology
Clinical Applications of Genomics in Rare Disease and Cancer
Clinical Neuroscience
Development and Disease
Human Medical Genetics
Images of Anatomy
Immunity and Infection
Medical Microbiology
Psychology, Psychiatry & the Mind
Science of Reproduction

**Optional 15-credit modules:**
Clinically Applied Musculoskeletal Anatomy
Genes and Gene Expression in Eukaryotic Cells
Neglected Tropical Diseases
Neuroscience of Sensation & Perception
Personalised Medicine
Pharmacology and Physiology of Drugs of Abuse

**Year 4 (compulsory Level 7 modules)**

Research Proposal (15 credits)
Research Project (105 credits)

**Programme reference points**
The following reference points were used in the preparation of this specification:
QAA guidelines on Master's Degree characteristics
QAA benchmark statements for Biomedical Science and Biosciences
QAA qualifications framework for England, Wales and Northern Ireland

*The description of the structure of the programme, including the lists of modules, is indicative and should not be regarded as full and definitive. For up-to-date information, please refer to the VLE course pages. Progression from Year 2 to Year 3 of the programme is dependent on specific progression criteria. Students who have completed Year 2 but do not meet these criteria will be transferred to the Biomedical Science BSc programme.*

*. Progression from Year 3 to Year 3 of the programme is dependent on specific progression criteria. Students who have completed Year 4 but do not meet these criteria will be eligible for the exit award of BSc (Hons) Science of Biomedicine.*

## F GENERAL TEACHING AND LEARNING STRATEGIES

A variety of teaching methods are used throughout the MSci degree programme. In the first two years, there are lectures, laboratory practicals and small-group teaching (including tutorials, scenario-based learning, scientific problem-based learning, self-directed learning schemes, and computer-assisted learning programmes). The content of the small-group teaching varies from one module to another but, in general, involves structured discussion, problem-solving exercises and essay assignments. The Group Study Project (GSP) and Independent Study Project (ISP), both of which are in the Personal & Academic Skills modules in Year 2, introduce students to in-depth searching, analysis and presentation of research literature. The GSP is conducted in small groups (~8-10 students) while the ISP provides guided, self-directed learning with feedback from a designated supervisor.

In Year 3, the teaching and learning strategies used in the course are varied according to the content of the subject matter, the course tutors and the number of students enrolled in any module. Student numbers on a module can range from more than 50 to less than 10. Most of the teaching is provided by academics (including outside speakers) who are experts in their respective fields. Emphasis is placed on self-directed learning along with strategies that maximise course participant involvement and provide opportunities for reflection and consolidation of prior and present learning. An important teaching strategy is to emphasise critical analytical skills. In addition, the course is enhanced by one-to-one teacher/learner interactions during the student Research Project in Year 4.

Combining these strategies during the course enables students to develop an investigative, independent and individualised approach to learning, and to undertake an extended research project in Year 4.

Students are also permitted to undertake an optional Professional Training Year between Years 2 & 3.

## G ASSESSMENT

A variety of methods of assessment are used throughout the course. Formal written examinations can contain Single Best Answer questions (SBAs), Short Answer Questions (SAQs), Long Answer Questions (LAQ), data analysis and handling, and essay questions. Students are also assessed by Objective Structured Practical Examinations (OSPEs). In Years 1 and 2, exams are held at the end of each semester for each module. In-course assessment (including essays, practical write-ups and special study reports) is also an important component of module marks in Years 1 and 2.

Year 3 taught modules are assessed by a combination of in-course assessment (essays, projects, practicals, oral and/or poster presentations) and written examination papers in May/June. In Year 4, the Research Proposal module is assessed by in-course assessment and the Research Project module is assessed by in-course assessment and dissertation.

In-course assessments and examination papers are marked in detail by one internal examiner or assessor, with at least one other internal or external assessor having an overview of the work submitted for the assessment. Assessments are moderated by external examiners, who are also required to approve examination papers.

Research Projects are assessed by an in-course mark (from the supervisor) and a combined mark based on the dissertation and a poster presentation. Projects are double marked internally and moderated by external examiners

In addition to the external examiners reviewing Years 1 and 2, there are several external examiners for specific modules and pathways in Years 3 and 4.

The marks from each stage of assessment contribute towards the final degree mark.

## H SUPPORT FOR STUDENTS AND THEIR LEARNING

In addition to its staff resources, St George's has a wealth of teaching and research laboratories, an extensive computer network, a large library and well-equipped computer classroom, specialized workshops and efficient academic service facilities.

The library holds a specialist medicine and health sciences collection of over 40,000 books, and audio-visual items, subscribes to over 10,000 print and electronic journals, and provides more than 250 reader seats (divided into quiet study, silent study and group study areas). Professional library staff liaise and work closely with academic staff involved in the Biomedical Science degree to ensure that students and staff are supported effectively.

The area has WiFi throughout as well as some desks with fixed data points (ethernet cables to connect laptop directly to the network rather than using WiFi). Power sockets are available at over 100 desks and a number of laptops are available for loan on a 4-hourly basis. During term time the library is open 24 hours from 08.00 Monday to 21.00 Saturday, and 09.00 to 21.00 on Sundays.

Upon enrolment, students take part in an induction programme to help their orientation. This includes introductions to the use of the Dissecting Room and general study methods. There are also induction sessions concerning the Registry, the Student Union, the Personal Tutor system, Safety and Occupational Health and Sexual Health Awareness.

In February/March of Year 2, there is an open day to present Year 3 module options so that students can make an informed choice. At the start of Year 3 students are given a short introductory talk by the Year 3 Lead, followed by an introduction to Health and Safety.

Guides and related session resources are made available to students via the VLE (virtual learning environment).

The Vice-President of the Students' Union and the Deputy Vice-Chancellor (Education) have overall responsibility for non-academic student welfare. In addition, all students have personal tutors who provide pastoral care as well as academic advice. There is also a Counsellor service which provides completely confidential help for students with problems. In addition, St George's subscribes to the 'Nightline' service, which provides 24-hour telephone advice to students. The Staff/Student Health Service, headed by a Consultant, provides a full healthcare service for students, administers health questionnaires which are sent to students before arrival at St George's, and ensures that all students are given appropriate immunisations and health checks.

## I CRITERIA FOR ADMISSIONS

**A level**
The Biomedical Science degree has a requirement of BBB. A2 level Biology and Chemistry must be included; the third A2 can be in any subject but General Studies is excluded.

**Irish Leaving Certificate**
Five Highers at grades A2, A2, B2, B2, B2 to include Maths, English, Chemistry and Biology (achieved in one sitting).

**Scottish Qualifications**
Candidates must offer three Advanced Highers including Chemistry and Biology with grades ABB. English Language and Maths National 5 at grade B.

**International Baccalaureate**
Overall score of 32 which must include: 15 points at higher level, with a minimum score of 5 in either Biology or Chemistry and 5 in the other. At standard level, a minimum score of 5 must be attained in Mathematics (or Maths Studies) and English, if at least a 6/B grade has not previously been attained in GCSE/IGCSE/O level Maths and English.

**European Baccalaureate**
We would expect an overall grade of 75%/7.5 with similar grades in Biology and Chemistry.

**GCSEs (or equivalent)**
Grade 6/B in minimum of 5 subjects including Maths, English Language, and Double Science Award (or Biology AND Chemistry as single subjects).

**English Language Qualifications**
Applicants who do not hold GCSE/iGCSE English Language at Grade 6/B and whose first language is not English must provide evidence of proficiency via the International English language Testing System (IELTS) or Pearson's English Language test. SGUL will accept test scores as valid for two years. The required overall score for IELTS is 6.5 (with at least 6.5 in writing and 6.0 in other 3 components). The required overall score for Pearson's is 59 (with at least 59 in writing and at least 51 in other 3 components).

## J CAREER OPPORTUNITIES

The MSci is aimed at students with focused ambitions in the area of science and research who wish to gain substantive research skills and undertake a substantive research project. The MSci equips students with the necessary experience and skills for:

- Future PhD study.
- Research posts in academia, pharma and the bioscience industries.
- In addition to, employment as clinical trials coordinators, posts in research funding bodies, NHS management, or graduate entry medicine.

## K METHODS FOR EVALUATING AND IMPROVING THE QUALITY AND STANDARDS OF TEACHING AND LEARNING

For the MSci Biomedical Science programme, a range of methods are employed:

- The Course Committee meetings have standing agenda items on course progress where student representatives can raise any issues.

- Reports of Student Evaluation Questionnaires are reviewed by the Course Committee.
- External Examiners' reports are reviewed by the Chair of Examiners and by the Exam Boards, as well as the Course Committee. Points requiring action are sent to the relevant members of academic or administrative or the Course Committee.
- The Chair of Examiners analyses the student marks annually, to monitor consistency between taught modules and years.

Other methods

- Staff appraisal against St George's criteria
- Teaching skills courses for staff
- Review of research activities of teaching staff

## L REGULATION OF ASSESSMENT

The course complies with the General Regulations for Students and Programmes of Study as devised by St George's. Examinations are conducted according to the Schemes of Assessment for the programme

## M INDICATORS OF QUALITY AND STANDARDS

External review

- QAA Institutional Audit Report
- External Examiner reports
- Research Assessment Exercise

Internal review

- Monitoring and responding to student feedback
- Monitoring of course content
- Regular analysis of student performance in assessments
- Annual analysis of student progression and final degree outcomes
- Periodic review

**Please note:** This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, course content, and the teaching, learning and assessment methods of each module can be found in the course handbooks and individual module guides.

**Key sources of information are:**
Course documents available on the VLE
SGUL prospectus
SGUL website (www.sgul.ac.uk)
SGUL General Regulations for Students and Programmes of Study
QAA subject review reports