EST 1892 LSBU

Course Specification

A. Course Information			
Final award title(s)	BSc (Hons) in Biomedical Science (With Placement) (FT)		
Intermediate exit award title(s)	Certificate in Higher Education (Cert HE) Biomedicine Diploma in Higher Education (Dip HE) Biomedicine		
UCAS Code	C500	**Course Code(s)**	5895
Awarding Institution	London South Bank University		
School	☒ ASC ☐ ACI ☐ BEA ☐ BUS ☐ ENG ☐ HSC ☐ LSS		
Division	Human Sciences		
Course Director	Name: Shpresa Haliti Email: halitis@lsbu.ac.uk		
Delivery site(s) for course(s)	☒ Southwark ☐ Havering ☐ Other: please specify		
Mode(s) of delivery	☒Full time ☐Part time ☐Sandwich		
Length of course/start and finish dates			

Mode	Length years	Start – month	Finish – month
Full time			
Full time with placement/ sandwich year	4	September	July
Part time			
Part time with Placement/ sandwich year			

Is this course generally suitable for students on a Tier 4 visa?	Please complete the International Office questionnaire Yes (FT only)

	Students are advised that the structure/nature of the course is suitable for those on a Tier 4 visa but other factors will be taken into account before a CAS number is allocated.		
Approval dates:	Course(s) validated	July 2019	
	Course review date	2024	
	Course specification last updated and signed off	July 2024	
Professional, Statutory & Regulatory Body accreditation	Institute of Biomedical Science (IBMS)		
Reference points:	Internal	LSBU Corporate Strategy 2020 -2025 Academic Quality and Enhancement Manual LSBU Mission Statement and Strategic Plan LSBU Core Skills Policy LSBU Academic Regulations Applied Sciences School Roadmap 2020-2025	
	External	OfS Conditions of Registration guidance Subject Benchmark Statement for Biomedical Science (QAA, 2019) Framework for Higher Qualifications (QAA, 2014) SEEC Credit Level Descriptors, 2021 Criteria and Requirements for the Accreditation and Re-accreditation of BSc (Hons) degrees in Biomedical Science (2021-2022), V2	

B. Course Aims and Features	
Distinctive features of course	This innovative programme is designed primarily for those students wishing to pursue careers as biomedical scientists in clinical service laboratories in any of the BMS specialist fields (Blood Science, Cellular Pathology, Clinical Microbiology or Molecular Science) or in biomedical research and pharmaceutical industry. “An honours degree in Biomedical Science accredited by the IBMS is acceptable as a preliminary academic qualification for registration with the Health and Care Professions Council (HCPC). By undertaking a period of laboratory training and completion of the Institute’s Registration Training Portfolio for the award of a Certificate of Competence, individuals are able to demonstrate they meet the fitness to practice standards (HCPC Standards of Proficiency) required for registration as a biomedical scientist. The degree gives eligibility for Licentiate membership of the IBMS*”* (Criteria and Requirements for Accreditation and Re-accreditation of BSc (Hons) degrees in Biomedical Science (final-4, 2020-2021).

	The course provides students with understanding and in-depth knowledge of human health and disease, and with embedded employability skills. In addition, two modules are entirely dedicated to developing employability skills and work experience. Students will acquire knowledge, intellectual and practical skills to understand human disorders and means of disease diagnosis and treatment through laboratory testing. A distinctive feature of the course is that it introduces the students to state-of-the-art tools used in precision medicine, such as bioinformatics, genomics, transcriptomics, proteomics, and high-throughput drug screening geared towards molecular target identification and targeted therapeutics. This falls under the BMS specialist field of Molecular Science. Furthermore, students will be trained to apply their knowledge to offer solutions and to develop opportunities in a wide range of clinical settings and industries that require a broad understanding of biomedical science. All the required core- and subject-specific biomedical science areas are covered as core modules in this course. Therefore, all students will gain the subject knowledge, practical and transferable skills that enable them to work as biomedical scientists, regardless of their chosen career track. In addition, the course allows students, through optional modules and/or University shared modules, to gain knowledge in areas, such as clinical, and pharmaceutical sciences. Graduates with BSc (Hons) Biomedical Science (With Placement) (FT) may apply for medical school (if they meet all the criteria required for graduate entry medicine), or pursue careers in biomedical research and, pharmaceutical industry.
Course Aims	**The BSc (Hons) in Biomedical Science aims to:** 1. Enable students to understand the biology of human health and disease, including the basic knowledge of human anatomy and physiology, cell biology, genetics and molecular biology, biochemistry, immunology, and microbiology. 2. Provide students with practical and laboratory skills relevant to the field of biomedical science and enable them to design and carry out an independent research project. 3. Provide the knowledge and understanding of disease processes in the context of laboratory investigations through clinical modules such as cellular pathology and imaging, clinical biochemistry, haematology and blood transfusion, and medical microbiology 4. Provide competency in data analysis, statistics, numeracy, an overview of big data analysis, and health informatics through the modules of bioinformatics and research skills for biomedical scientist, and clinical OMICS and precision medicine.

	5. Make students aware of employability pathways early on, and develop their leadership skills, analytical thinking, critical evaluation, and entrepreneurial skills, teamwork, time management, negotiation skills and communication skills, particularly those from local areas in accordance with the policies and practice of equality and diversity. 6. Develop students' awareness of the need for compliance with health and safety policies, good laboratory practice, risk and COSHH assessments, the Human Tissue Act and the importance of quality control and quality assurance.
Course Learning Outcomes	**On successful completion of the course**: **A. Students will demonstrate knowledge and understanding of:** A1. The basic biology of human health and disease represented by the disciplines of human anatomy and physiology, cellular, genetic, and molecular biology, microbiology, immunology, chemistry, and biochemistry. A2. Basic principles of laboratory-based diagnostic and analytical techniques used in clinical pathology, human haematology and clinical immunology, clinical biochemistry and blood transfusion, and medical microbiology. A3. Aetiology, progression, and diagnosis of human diseases to support clinical management and treatment selection. A4. Bioinformatic and statistical principles for analysis of big data for the study of genomics, proteomics and transcriptomics, and their application in precision medicine. A5. Research design, quantitative/qualitative methods, critical review of evidence in the biomedical sciences, data interpretation, reporting, biosafety, ethics, and conduct. **B. Students will develop their intellectual skills such that they are able to:** B1. Apply theories, paradigms, concepts, or subject-specific principles to a new context. B2. Obtain and integrate lines of subject-specific evidence to formulate hypotheses, design experiments, critically evaluate data and use it to develop research proposal. B3. Demonstrate independence of thought to identify the key features of a problem and suggest possible means of investigation.

	B4. Keep abreast of current insights in core and specialist areas of biomedical science. B5. Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct. B6. Synthesise, analyse, and summarise a body of information and come to an informed and logically consistent conclusion. **C. Students will acquire and develop practical skills such that they are able to:** C1. Demonstrate competence in the basic experimental skills relevant to cell and molecular biology, genetics, human anatomy and physiology, medical microbiology, cellular pathology, and imaging, clinical biochemistry, and blood transfusion. C2. Demonstrate knowledge of quality assurance and quality control principles, hazard identification, risk assessment and safety procedures associated with a particular technique or methodology. C3. Select and apply appropriate techniques and evaluate alternative methodologies for an investigation or to complete a process. C4. Undertake practical investigations in a responsible, safe, and ethical manner, while observing relevant health and safety regulations. C5. Organise and allocate duties, set targets, and evaluate progress in achieving specific technical goals, evaluate own performance and performance of others within a team. C6. Use relevant numerical quantitative techniques and demonstrate competence in bioinformatic and statistical methods to validate, calibrate and analyse big data. C7. Present data in seminars or small-group tutorials to develop interpersonal skills such as information retrieval, problem-solving, communication and team working. C8. Demonstrate competence in the use of word-processors, spreadsheets, biological databases, and data presentation packages. **D. Students will acquire and develop transferrable skills such that they are able to:** D1. Identify individual and collective goals and responsibilities.

	D2. Develop the ability to work on one's own initiative and manage one's own time to meet deadlines. D3. Develop negotiation skills, and lifelong learning in the field of biomedical science including enterprise and knowledge transfer skills. D4. Provide reflective and evidence-based solutions to problems. D5. Recognise and respect the views and opinions of other team members. D6. Evaluate their own performance as an individual and as a team member, as well as the performance of others. D7. Develop a flexible and effective approach to study and work. D8. Communicate ideas, arguments, and concepts in a rational and systematic way, using a variety of media. D9. Clearly communicate in writing for both academic and lay audiences. D10. Use the full range of sources of information, citing references properly and avoiding plagiarism.

C. Teaching and Learning Strategy

- The teaching and learning (T&L) strategy employed in the course is designed to encourage a progressive approach towards the acquisition of subject knowledge and practical skills in a gradual manner, thus leading the students from a greater level of support provided in level 4 towards a more independent and self-directed learning at level 6.

- Teaching and learning activities vary based on the module aims and learning outcomes. All modules offered at level 4 provide the basic background of Chemistry and Biochemistry, Cell Biology, Human Anatomy and Physiology, Genetics and Molecular Biology, Microbiology, and Immunology (A1) through a blend of keynote lectures, tutorials, group work, flipped learning, and problem-based learning activities. Many of the first-year modules develop and assess practical skills for which students have to demonstrate competence. The laboratory-based practical will predominantly use approaches that engage students through structured laboratory demonstrations, practical experiments, group work, and problem-based learning. Attendance/passing laboratory practical is compulsory to achieve an accredited degree. Developing the students' employability skills is of prime importance and these skills are introduced at L4 through the module "Employability Skills in Biomedicine".

- After students gain the fundamental background in core biological subjects at level 4, they will be introduced at level 5 to modules dealing with aetiology of human disease, disease progression, diagnosis, and treatment (A2 and A3). These modules include Cell Pathology and Imaging, Human Haematology and Clinical Immunology and Clinical Biochemistry and Blood transfusion, which provide students with basic necessary skills to perform diagnostic tests in hospitals or in clinical laboratory settings. During level 5,

the students will be also introduced into essentials of Bioinformatics, Biostatistics and into Research skills for Biomedical Scientists (A4); thus, allowing an assessment of student ability in Mathematics, Statistics, Bioinformatics and English. The social and ethical context of Biomedicine also begins in the Bioinformatics and Research skills for Biomedical Scientists module where students discuss case studies on some aspects of scientific ethics. The latter emphasises critical review and argument development using exercises, and reviews current key biomedical issues (A5). This module also begins the student's induction into the scientific method (A5). The latter is further developed in the third year (level 6) in the Research Project in Biomedicine module, which concentrates on data generation, analysis, and presentation, including accessing and review of published sources. This module provides additional practice and assessment of research skills and scientific writing, and the students have to research and develop a workable project proposal to be conducted in their final year (A5).

- At level 6, students will continue to receive training in clinical sciences such as in Medical and Public Health Microbiology. The Bioinformatics and Research skills for Biomedical Scientists module offered to the students at level 5 serves as a background for the Clinical OMICS and Precision Medicine module at level 6 (A5). The latter deals with current technologies in genomics, transcriptomics, and proteomics used in precision medicine for diagnosis, patients' stratification, and treatment options. This module will also introduce the students to the basics of systems biology (A5). In addition, students will select two optional modules relevant to the career choice.

- Lectures will convey major elements of the subject-specific content and provide explanations of difficult concepts. Lectures will facilitate the development of students' active listening skills, and enable them to appreciate how information is structured, and presented. Additionally, lectures will involve computer-based aids, and multimedia, as well as will encourage the interactive participation of students in groups.

- A schedule of personal tutoring monitors student progress especially during the first year. The details of this and the action taken by the student to address any weaknesses will be recorded (see Appendix B).

- All modules employ teaching methods that encourage students to consider and challenge the evidence with which they are presented. The assessment schedule requires students to question and evaluate the arguments surrounding some key concept or principle. This may be formally assessed or simply part of group discussions, debates or as part of some problem-solving exercises. Biology of the Cell, Biochemistry, Genetics and Molecular Biology at level 4 introduce the students to current thinking over a range of rapidly developing areas in biology and biomedicine, and to look at the different approaches being adopted to analyse these in a series of in-class workshops and coursework tasks (B1and B2). Bioinformatics and Research skills for Biomedical Scientists at level 5 and the Research Project in Biomedicine module at level 6 have specific lectures on how to approach the primary literature and evaluate the evidence presented (B1, B2, B3, B4). This is assessed by the project proposal the student is required to generate as part of this module (B2), in preparation for their final year, and which must include a preliminary experimental design (B2, B3). The topics selected for the research proposal must be current and up to date, thus requiring the students to keep abreast of current insights in core and specialist areas of biomedical science (B4). According to the criteria for IBMS accreditation (2020-2021), the research

project will be either lab-based, or in bioinformatics or biostatistics such as meta-analysis. Additionally, the research proposal will have to be approved by the research ethics committee at the school, thus requiring the students to recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct (B5). The final year project report must finish by placing the findings in the context of current thinking (B6).

- Laboratory skills and technical proficiency in analytical methods are developed from the first year to the third-year modules through practical elements that offer subject-specific techniques (C1, C2 and C3). This is further reiterated during the final year Project.

- Through the two employability-focused modules (Employability skills in Biomedical Science at L4 and Work Experience in Biomedical Science at L5) we will provide the students with the opportunity to apply the intellectual (B1-6), the practical (C1-8), and transferable skills (D1-10) acquired throughout the program and will prepare them for their chosen careers. Additionally, at L5, each student will select one optional module relevant to their career choice.

- A key emphasis of the Biomedical Science programme is the development of the student's practical and analytical skills through subject-specific and generic practical. Students are inducted into teamwork skills, and into health and safety regulations, and their evaluation from their first sessions in Bioinformatics and Research skills for Biomedical Scientists (C4). Part of their assessment is to evaluate their performance and that of their group, to encourage them to be reflective about their approach (C5), and to manage their activity to best effect.

- Skills in Biostatistics and Bioinformatics, and *in silico* approaches to practical work are developed at level 5 and 6 to analyse big data using relevant biological databases (C6).

- Presentation skills are practiced from level 4 and extend up to level 6 in most modules. Group work, including the use of word processing software, spreadsheets and presentations that review recent scientific literature, features in several subject-specific modules at level 5 and 6 and in the Research Project in Biomedicine module (C7 and C8). Bioinformatics and Research skills for Biomedical Scientists and subject-specific modules encourage the students to consider alternative ways to approach specific problems, or to address specific questions (C1, C2, C3), typically through their practical work. In this way we are able to build student confidence in their technical and practical skills and reinforce the basic concepts delivered in the associated lecture programme.

- The transferable skills are fully mapped through the curriculum, principally through the core modules. Career Management Skills will be offered through the Employability skills in Biomedical Science at level 4, in addition to the annual employability workshop, in which the course team and representatives from relevant sectors will give talks about career options and skills required for different career pathways. The module and workshop will also involve group work facilitated by staff members to help the students identify individual goals (D1), and to introduce them to negotiation skills and self-development skills (D3). This is to ensure that personal development planning is mapped throughout the course, is obvious, and transparent to the students and is fully supported by the personal tutoring system from the first year. There is also subsequent testing of scientific writing skills (D9) and preparation for researching future possible

careers. A number of further tasks assessed in Bioinformatics and Research skills for Biomedical Scientists measures students' progress in managing their own learning (D2) and students are required to assume responsibility for this, under the guidance of their personal tutor. In-class worksheets, problem-solving exercises and group-based work at level 4 and level 5 provide rapid feedback and encourage students to review and develop their approaches to their learning (D4, D7). Across most modules students are required to work in teams, and to present in front of peers to develop communication skills (D8), the skills of respecting opinions of other team members (D5), and the skills of evaluating their own- and others' performance (D6). Through preparing their final year project students will learn to cite references and avoid plagiarism (D10).

- During the sandwich program, work-based placement will take place. A staff member from the biomedical science team at LSBU will supervise the student's progress during the professional training placement year together with a representative from the placement provider organization. Work-based placement will provide the students with the opportunity to apply the intellectual (B1-6), the practical (C1-8), and transferable skills (D1-10) acquired throughout the program and will prepare them for their chosen careers. More details about placement options and their relationship to the career track chosen by students are provided in the placement handbook.

- Excellent command of technical English is essential for biomedical scientists. Students whose first language is not English will have several opportunities to improve their language skills on the levels of reading, comprehension, speaking and writing so that at the point of graduation they must attain the equivalent of IELTS level 7.0. All lectures, tutorials and laboratories are in English. Presentation and writing skills are practiced from level 4 and extend up to level 6 in most modules, culminating with writing a research project of 8000 words at L6 and presenting the results in a *viva voce*. English language skills are also embedded within the "academic skills development plan" that the School of Applied Sciences will scaffold around degree programs to specifically develop both academic/graduate and employability skills in our students and ensure increased opportunity for student success and progression to employment. These skills include the development of reading and writing skills. All enrolled BMS students will be required to complete the Personal Development Plan and write a reflection about the results during the first two weeks of the first year of study (L4). Themes within the academic skills development toolkit, including development of English reading and writing skills are available through this link: https://www.lsbu.ac.uk/research/academic-skills-toolkit. Additionally, students may want to join the preparation for IELTS course at Lambeth College, which is part of the LSBU group. This course is designed for students who would like to improve their language skills for study or job in the UK. On this course students will practice and improve their reading and writing skills and undergo intense study and practice grammar. More information about this course is available at https://www.southbankcolleges.ac.uk/courses/esol/preparation-for-ielts.

- Digitally Enhanced Learning will be incorporated into the T&L strategy to develop and support learning. Examples will include the University VLE (Moodle), Panopto lecture capture and on-line formative assessment platforms, discussion groups and remote tutorial support.

- Students will be expected to engage in independent learning as outlined in each of the module descriptor documents which will be made available on the Moodle sites. Where appropriate this learning will be guided by staff via tasks set in class and on the VLE.

- A wide range of subject-related resources are available within the LSBU Library. These reflect a typical academic repository that includes access to textbooks, licensed E-journal subscriptions, scientific databases, interactive e-learning platforms, and multimedia. Moreover, students have access to site-licensed software and assistive technologies to support their learning (if registered for Disability and/or specific learning difficulties).

- The current infrastructure is well equipped to support the course. There are a total of 7 teaching and research laboratories that provide a rich learning environment for combining theory and practice. Each contains state-of-the art equipment to support delivery across all core and specialist modules.

- The core staff that will teach on the programme comprise: 1 Professor, 2 Associate Professors, 2 Senior Lecturers, and 3 Lecturers (at the time of writing). Contributions to the programme may also be made by guest lecturers, external practitioners from the NHS as hourly paid lecturers and postdoctoral trainees. All staff are appropriately qualified and where postdoctoral trainees are involved, they will be appropriately trained and supervised.

D. Assessment

i) Assessment will be progressive in terms of level and content and leads to effective feedback to enable development of students' knowledge and skills as per the subject benchmark statement-biomedical science-2019.

ii) The course will use a blend of formative and summative assessment, as well as self- and peer assessment. Formative assessment will provide structured feedback to support students in the summative task, therefore scaffolding the approach to assessment and ensuring appropriate development of critical thinking, academic writing, practical and technical comprehension, and creativity.

iii) Students experience variety of assessment during their first and second years, including testing of their practical and analytical skills through level 4 modules' coursework, practice tests and laboratory reports. Proficiency in Mathematics and English is assessed during the Bioinformatics and Research skills for Biomedical Scientists module (A4). Knowledge is tested by unseen written examinations in as well using essays or problem-solving exercises across the modules (A1, A2, A3).

iv) Level 5 and 6 assessments is a combination of examination, a variety of coursework, including presentations, essays, in-class problem-solving exercises and calculations (A4), devising of experiments (A5), case studies and a final year project (A5). The latter develops out of an extended literature search and initial experimental design (project proposal) submitted at level 5 within Bioinformatics and Research skills for Biomedical Scientists module.

v) Most examination papers at level 5 and all at level 6 also demand the intellectual skills. English language skills (comprehension, reading and writing) will be assessed through coursework essays and extended essays at all levels. Real world problem-based

learning exercises at all levels typically require students to work individually or collectively by applying their understanding of current thinking or methodologies to a new context (B1, B2, B3)

vi) Assessments in the Bioinformatics and Research skills for Biomedical Scientists module require the students to demonstrate their competence using the range of bioinformatics tools, and statistical methods using worksheets completed on regular basis in compulsory workshops (C6, C8). The rest of the assessment for the latter module requires students to produce a viable experimental design through discussion with their supervisor, in preparation for their final year project (C2, C3, C4, C5).

vii) Their capacity to summarise and critically evaluate methodologies is assessed in the Research Project in Biomedicine module at level 6 (C2, C3, C4, C5, C7, C8). This module also seeks to establish good investigative techniques, by applying skills and attributes acquired in other modules, and as a result of working in close association with a supervisor on a well-defined experiment (C3). The assessment here requires the student to keep a contemporaneous lab book and to produce a paper close to submission standard and defend this in a viva voce examination (C1-C8).

viii) A range of modules at level 4 and 5 require students to manage a task and to be able to communicate their findings to their cohort. Bioinformatics and Research skills for Biomedical Scientists requires them to summarise the recent scientific literature on a topic and use this to develop a hypothesis and associated experimental design. Some of the higher-level attributes are only fully assessed at level 6 in the largely independent work in the research project (D1, D2, D4, D8). These require a flexible approach to data acquisition, interpretation and presentation, and the use of a full range of sources of information and proper citations (D7, D10). The development of a research proposal and establishing an investigation protocol begins in Semester II of the second year as part of the assessment of Bioinformatics and Research skills for Biomedical Scientists (D1, D2, D8, D9).

ix) Employability and work experience skills are assessed at levels 4 and 5 through writing reports and group presentations, and a portfolio at L5.

x) Presentations, debates, essay writing and seminars are used extensively at each level which assess these skills in addition to the students' English language skills (reading, comprehension, writing and speaking) and through feedback, students are encouraged to polish these skills up to their final year (D4, D8, D9). The case studies in Bioinformatics and Research skills for Biomedical Scientists assesses the student's ability to argue logically on a topic in scientific ethics (C2, C4). Once again, many of these skills and attributes are brought together to complete the final year project (D1-D10), and the assessment of these are one of the principal elements by which the graduate status of the student and their English language proficiency is assessed.

xi) Table 2 (below) shows how the course will be assessed by module. All career choices share a similar variety of summative assessment, with all comprising coursework (written essays, oral presentation, oral discussion, or group work) and the majority also include a final exam. Most modules carry several points of assessment; however, in some, there are sub-components of the coursework comprising a blend of assessments (e.g., practical demonstration + essay, or oral presentation + module viva). In the Research Project in

Biomedicine module, 50% of the overall assessment will be for the 8000- word dissertation, 15% for the interim report, 20% for the project management, and the *viva voce* of the work will constitute 15% of the overall summative assessment for this module.

xii) Students must achieve a pass mark in all assessment components for modules that cover the clinical laboratory sciences subject areas. Condonement/compensation will not be permitted for these modules or for any other module(s) that contribute significantly to the benchmark statement and have learning outcomes that students achieve that cannot be evidenced elsewhere (*IBMS criteria, 4.2 (v)*).

xiii) In order to obtain an award, students must pass all required modules (for the relevant award: CertHE; DipHE; Honours Degree) and gain the required number of credits as stated in the LSBU regulations.

E. Academic Regulations

The University's Academic Regulations apply for this course.
https://www.lsbu.ac.uk/about-us/policies-regulations-procedures

IBMS accreditation requires that the students acquire practical skills to prepare them for biomedical science careers. For this reason, attending labs is a requirement for accreditation. Condonement and compensation will not be applicable for the clinical modules specified in the IBMS course accreditation criteria, and for these modules, a minimum pass mark of 40% will be required in the assessment components. Intermediate exit awards such as Certificate in Higher Education (Cert HE) or Diploma in Higher Education (Dip HE) will not include the title Biomedical Science.

F. Entry Requirements

In order to be considered for entry to the course, applicants will be required to have the following qualifications:

Level 4 entry

- A-Level qualifications with grades BCC, which must include Biology or Human Biology, and a second STEM subject chosen from Chemistry, Physics, Mathematics, Further Mathematics, Statistics, or Psychology.
- Alternatively, you may qualify with a BTEC Extended Diploma in a relevant Science field such as Science, Life Science, Applied Science, Medical Science, or Forensic Science, with grades ranging from DMM to DDM.
- Another pathway equivalent to **Level 3 Science qualifications** for example International Baccalaureate
- Applicants must have a minimum of 5 GCSEs, each with grades at least C (4) or above, including Mathematics, Double or Triple Science, and English Language.
- English language qualifications for international students: IELTS score of 6.0 or Cambridge Proficiency or Advanced Grade C. **Note:** International students enrolled in a sandwich course and completing an IBMS registration portfolio must have obtained an IELTS score of at least 7.0, which should not be older than 2 years before applying for HCPC registration (www.hcpc-uk.org).

Direct Entry to Level 5

Students with the knowledge and skills equivalent to the required learning outcomes for Level 4 modules of the BSc (Hons) Biomedical Science (FT) will be encouraged to make direct entry to Level 5. Such knowledge and skills should be commensurate with those identified in the IBMS criteria for accreditation handbook (QAA template), in the ***Policy*** and Procedures for the Accreditation of Prior Learning (APEL), of London South Bank University APEL, and in the guidelines on levels and learning outcomes produced by the South East of England Consortium for Credit Accumulation and Transfer (SEEC/CAT, May 1996, SEEC Credit Level Descriptors for HE, 2021)

G. Course structure(s)

Course overview

Awards are given in accordance with current London South Bank University Academic Regulations for Taught Programmes. The overall modular structure of the BSc (Hons) Biomedical Science is shown in Figure 1. Fourteen core modules (total credit accumulation: 300 credits), including a Research Project (40 credits) will be common to two career choices. In addition, three optional modules (total credit: 60 credits) will be required to be selected by students in level 5 and level 6 from each career choice (Table 1). The two career choices are i) Applied Medical Sciences, and ii) Pharmaceutical industry, (please see the course specifications for details). Students will find placement for a year between level 5 and level 6 at either at the NHS or equivalent clinical settings, in the pharmaceutical and biomedical industry, or in a research laboratory in a different organization.

The academic year will run as usual in two Semesters from September to June.

The degree will be offered as FT with a placement sandwich year (4 years). Details of modular structure are shown in Figures 1 and Tables 1 and 2 below.

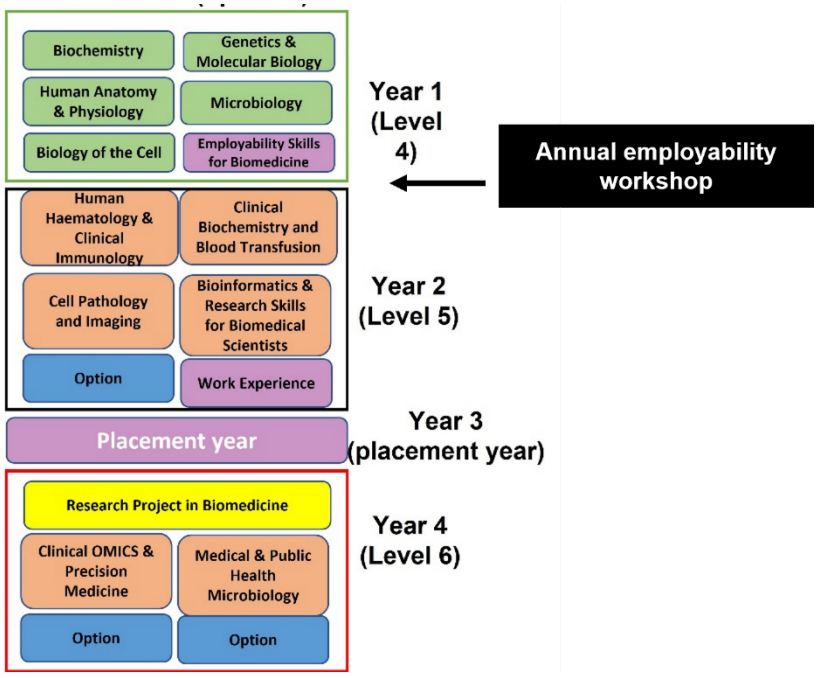

Figure 1. Course Structure for BSc (Hons) Biomedical Science (With Placement) (FT) (2022-2025).

Option modules

Option modules will form coherent "career choices" within the course structure, so their individual selection will be defined by the students' interests. It is intended that the students will meet with their personal tutors and discuss their personal career plans to ensure the selected Options are appropriate and meet their individual aspirations. Seven Option modules are included in the Module Descriptor document (at the time of writing). These modules meet the credit requirements of any of the two career choices shown in Table 1. Additional Option modules will be added as the course is developed.

Table 1. Optional modules for BSc (Hons) Biomedical Science (With Placement) (FT)

"Career Choice"	Level	Option
Applied Medical Sciences	5	Stem Cells and Developmental Biology
	6	Cancer Biology and Therapy, Neuroscience and Aging, Clinical Nutrition and the Microbiome
Pharmaceutical Industry	5	Introduction to Pharmacology and Toxicology
	6	Bioreactors, Drug Design and Development

Placement information and employability

Maximising graduate employment opportunity is a central consideration in the design of the proposed career choice(s) in Biomedical Science. In addition to the array of graduate skills, both transferable and subject-specific, the course is providing throughout the modular structure, a graduate employability workshop will be offered at the end of Level 4. This workshop will host representatives from diverse professional bodies. The purpose of this workshop is to help the students identify the career choice they want to pursue from the first year of their studies. The workshop will also include talks highlighting relevance of learning to employability, and practical skill acquisition in presentation, CV writing and communicating to diverse audiences. In addition, two core employability and work-experience modules are offered to develop the students' professional skills in biomedical science.

In addition, students take the 'sandwich year' between Level 5 and 6. This offers considerable benefits to the students in terms of enhancement in their skills, adaptability, and employability. The aim of the professional training year is to give students first-hand experience of current scientific practices at the NHS or in health-related institutions, or in pharmaceutical and biomedical industry, or in biomedical research laboratories. This professional training year helps to reinforce what students have learnt and to provide a valuable addition to their curriculum vitae. In addition to the value of the work experience itself, the placement often improves future employment prospects.

Students are to find their own placements, but staff will be happy to help if necessary. A placement handbook that includes a list of relevant placement options is available to students. The placement tutors brief the students and provide support and advice in applying for positions, as well as maintaining a noticeboard where opportunities are posted.

During the placement, the student spends up to 40 weeks in at the placement provider organization and the University continues to monitor student progress throughout the training

period. The student is visited three times by the placement tutor working in close liaison with a supervisor in the place of work. The placement is assessed by formal reports approved by the placement supervisor and assessed as pass or fail by LSBU placement tutor. Details about the placement year are included in the placement handbook.

Career choices, placements, and option modules: At the end of L4, students will choose the career track they would like to follow, as well as option modules relevant for each career choice. An optional career choice will only run if the minimum threshold for students (*n*=8) is recruited. Students who are interested in a career choice that does not reach its threshold will be offered an alternative choice. It is their decision to accept the alternative offer. This information will be communicated to students before enrolment so that they will be made aware that the career track of their choice may not be available if certain modules have not reached the threshold to be offered, i.e. fewer than 8 students have enrolled. The two available career choices are:

(i) **Applied Medical Sciences:** students who choose this career choice may pursue careers in clinical NHS or private health laboratories, or in biomedical research. Additionally, students who meet the requirements for graduate entry into Medical Schools, or the requirements of enrolling in a physician associate training program may apply to relevant Schools providing these courses. Optional modules available for students in the applied medical sciences include modules of clinical relevance such as “Cancer Biology and Therapy”, “Stem Cells and Developmental Biology”, “Neuroscience and Ageing”, and “Clinical Nutrition and the Microbiome” (Table 1). Placements can be sought in NHS laboratories and health-related institutions. A list of potential available placement options will be available in the placement handbook provided to students.

(ii) **Pharmaceutical Industry:** students who choose this career track may pursue careers in the pharmaceutical, or biomedical industry such as those working in small molecules, clinical research and monitoring, next-generation sequencing, diagnostics, blood stem cell & bone marrow transplantation. Students may work in quality assurance to ensure that the pharmaceutical healthcare products are produced in accordance with quality and safety guidelines. Students may also work in marketing and sales and customer support. Placement opportunities may allow students to collaborate directly with various departments in the company which will give you a thorough grasp of how the pharmaceutical supply chain operates. Whatever placement you take on, you will be using your existing skills and learning new ones such as teamwork, problem-solving and network development. An expert team of analysts and scientists will teach and guide you throughout the year to help you reach your potential.

Optional modules available for students in this career choice include “Introduction to Pharmacology and Toxicology”, “Drug Design and Development”, and “Bioreactors” (Table 1).). Placements can be sought at pharmaceutical or biotechnology companies that deal with technologies for drug discovery and development, Antibody production, Biologics, Cell Therapies, Cancer Drugs, Vaccines, RNAi, Gene Therapy and CAR-T cell therapy. A list of potential available placement options will be available in the placement handbook provided to students.

Students who chose any of the above career tracks may also decide to pursue postgraduate studies in a biomedical science-related field of research.

H. Course Modules

Table 2 shows the core and optional modules, and their assessment.

Table 2. Core and optional modules, and their assessment.

Course Modules					
Module Code	**Module Title**	**Level**	**Semester**	**Credit value**	**Assessment**
ASC_4_498	**Human Anatomy and Physiology (Core)**	4	1	20	50 % CW (lab report) 50% exam
ASC_4_488	**Biochemistry (Core)**	4	1	20	30 % CW (presentation on practical component) 70% exam
ASC_4_476	**Biology of the Cell (Core)**	4	1	20	50 % CW on practical component 50 % exam
ASC_4_489	**Microbiology (Core)**	4	2	20	50 % CW (laboratory report) 50% exam
ASC_4_490	**Genetics and Molecular Biology (Core)**	4	2	20	30 % CW (lab report on practical component) 70% exam
ASC_4_ESM	**Employability Skills in Biomedicine (Core)**	4	2	20	30% CW1- Group presentation 70% CW2- written report
ASC_5_HCI	**Human Haematology and Clinical Immunology (Core)**	5	1	20	40 % CW on practical component 60 % exam
ASC_5_493	**Cellular Pathology and Imaging (Core)**	5	1	20	50% CW on practical component 50% exam
ASC_5_IPT	Introduction to Pharmacology and Toxicology (Option)	5	1	20	30 % CW (lab report on practical component) 70% exam

ASC_5_SDB	Stem Cells and Developmental Biology (Option)	5	1	20	50% CW: Students will prepare an essay on current topics in Stem Cell research 50% exam
ASC_5_BRB	**Bioinformatics and Research Skills for Biomedical Scientists (Core)**	5	2	20	50%CW1- Research Proposal 50 % CW2- (computer exercises in bioinformatics and biostatistics)
ASC_5_CBT	**Clinical Biochemistry and Blood Transfusion (Core)**	5	2	20	40% Laboratory practical test 60% exam
ASC_5_PBS	**Professional Skills in Biomedical Science (Core)**	5	2	20	50%-CW1 portfolio 50%-CW2 (Group presentation)
ASC_6_RPB	**Research Project in Biomedicine (Core)**	6	1 & 2	40	100% CW (Research project)
ASC_6_CMB	**Clinical Microbiology (Core)**	6	1	20	50 % CW (laboratory report) 50% exam
ASC_6_CBT	Cancer Biology and Therapy (Option)	6	1	20	50% CW Poster presentation 50% exam
ASC_6_BIR	Bioreactors (Option)	6	1	20	40% CW (PBL-poster presentation) 60% Exam
ASC_6_497	**Clinical OMICS and Precision Medicine (Core)**	6	2	20	50 % CW (Exercise on big data) 50% exam
ASC_6_NAA	Neuroscience and Aging (Option)	6	2	20	40% CW (PBL-presentation) 60% Exam
ASC_6_CNM	Clinical Nutrition and the Microbiome	6	1	20	50% (Group presentation) 50% CW2 (In class test)

ASC_6_DDD	Drug Design and Development (Option)	6	1	20	30 % CW (lab report on practical component) 70% exam

I. Timetable information

- Timetables will be provided to students via Moodle sites as soon as possible before the start of each semester.
- Typical contact hours for each week will range from 9 to 15 hours depending on the level of study and the modules that run in a semester. Modules that have laboratory sessions will normally have more contact time in a week than those without.
- Each module is timetabled for 1x3 hour block in a week (except those with laboratory sessions)..

J. Costs and financial support

Course related costs

Costs that are in addition to the tuition fees in this course may include:

- The cost of textbooks and journal subscriptions.
- Student membership of relevant professional bodies and organisations such as the Institute of Biomedical Science.
- Costs related to subject specific seminars or conferences.
- Any extracurricular courses that a student wishes to take that are NOT provided and supported financially by the University, and accreditation applications.

Tuition fees/financial support/accommodation and living costs

Information on tuition fees/financial support can be found by clicking on the following link:
http://www.lsbu.ac.uk/study/undergraduate/fees-and-funding or
http://www.lsbu.ac.uk/study/postgraduate/fees-and-funding
https://www.lsbu.ac.uk/international/fees-and-funding

Information on living costs and accommodation can be found by clicking the following link:
https://www.lsbu.ac.uk/student-life/our-campuses/southwark/cost-of-living

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Appendix A: Curriculum Map

This map provides a design aid to help course teams identify where course outcomes are being developed, taught, and assessed within the course. It also provides a checklist for quality assurance purposes and may be used in validation, accreditation, and external examining processes. Making the learning outcomes explicit will also help students to monitor their own learning and development as the course progresses. *T is taught, D is developed, and A is assessed.*

L	Module Title	A					B						C								D									
		1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5	6	7	8	1	2	3*	4	5	6	7	8	9	10
4	Biology of the Cell	T/A	T				T/A			D/A		D/A	T/A							A	D	D/A		A		D	D		D/A	D/A
4	Biochemistry	T/A	T							D/A		A	T/A	T					A	A	D	D					D	D/A	D/A	D/A
4	Microbiology	T/A	T/A	T		T/A	T				T/A	A	T/A	T/A		T/A				A	D					D	D	D	D/A	D
4	Human Anatomy and Physiology	T/A	T/A				T					A	T/A			T				A	D	D/A					D		A	A
4	Genetics and Molecular Biology	T/A	T/A				T/A			T/A		A	T/A		T	T			A	A	D	D/A		D/A			D	D/A	D/A	D/A
4	***Employability Skills in Biomedicine***					T/A	T/A		D	D/A	D/A	D/A		D/A			D/A		D/A	D/A	D	D/A	D	D	D/A	D/A	D/A	D/A	D/A	D/A	D/A

5	Human Haematology and Clinical Immunology	T/A	T/A	T/A		T/A	T/A			T/A	D	A	T/A	T/A	T/A	T/A			A	A		D/A		D/A			D	D/A	A	D/A
5	Bioinformatics and Research Skills for Biomedical Scientists			T	T/A	T/A	T/A	T/A	T/A	T/A	T/A	T/A		T/A	T/A		T/A	T/A	T/A	T/A	D/A	D/A		D/A		D/A	D	D/A	D/A	D/A
5	Cellular Pathology and Imaging	T/A	T/A	T/A		T/A	T/A		A	T/A	T/A	T/A	T/A	T/A	T/A	T/A	T/A	T/A	D/A	D/A		D		D	D	D	D	D/A	D/A	D/A
5	Clinical Biochemistry and Blood Transfusion	T/A	T/A	T/A		T/A	T/A	T/A		T/A	T/A	T/A	T/A	T/A	T/A	T/A	T/A	T/A	D/A	D/A	T/A	D	T/A	D/A	D/A	D/A	D	D	D/A	D/A
5	*Stem Cells & Developmental Biology*	T/A	T/A	T/A		D/A	D/A	D/A	D/A	D/A	T/A	D/A		T/A	D/A		D		D/A	D/A	D/A	D/A	D	D/A	D/A	D/A	D/A	D/A	D/A	D/A
5	*Introduction to Pharmacology and Toxicology*	T/A	T/A	T/A		D/A	D/A	D/A	D/A	D/A	T/A	D/A		T/A	D/A		D		D/A	D/A	D/A	D/A	D	D/A	D/A	D/A	D/A	D/A	D/A	D/A
5	**Professional Skills in Biomedical Science**					T/A	T/A		D	D/A	D/A	D/A		D/A			D/A		D/A	D/A	D	D/A	D	D	D/A	D/A	D/A	D/A	D/A	D/A

6	Research Project in Biomedicine	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	D	A	A	A
6	Clinical OMICS and Precision Medicine	T / A		T/ A	T/ A	T/ A	T/ A	T/ A	A	T / A	T/ A	T / A			T / A		D / A	T / A	T / A	D / A	D	D / A	D	D	D	D	D	D	D / A	D / A
6	Clinical Microbiology	T / A	T/ A	T		T/ A	T				T/ A	A	T/ A	T/ A		T/ A				A	D					D	D	D	D / A	D
6	*Neuroscience and Ageing*	T / A		T/ A		T/ A	T/ A	T/ A	A	D					D		D			D / A	D	D					D / A	D / A	D / A	
6	*Drug Design and Development*	T / A		T/ A		T/ A	T/ A	T/ A	A	D					D		D			D / A	D	D					D / A	D / A	D / A	
6	Cancer Biology and Therapy	T / A	T/ A	T/ A		D/ A	D/ A	D/ A	D/ A	D / A	T/ A	D / A		T/ A	D / A		D		D / A	D / A	D / A	D	D / A	D / A		D / A	D / A	D / A	D / A	D / A	D / A

Key 1: T = Taught, i.e. contributing in some way to the Learning Outcomes; D = Developed i.e. a focus of the module; A = Assessed and therefore also developed, Key 2: L=Level, Modules in italics are optional modules

**D3: negotiation skills, and lifelong learning in the field of biomedical science including enterprise and knowledge transfer skills will be developed during the career workshop offered in level 4, and during optional modules in level 5 and 6.*

A. Knowledge and understanding:

A1. The basic biology of human health and disease represented by the disciplines of human anatomy and physiology, cellular, genetic and molecular biology, microbiology, immunology, chemistry and biochemistry.

A2. Basic principles of laboratory-based diagnostic and analytical techniques used in clinical pathology, human haematology and clinical immunology, clinical biochemistry, and blood transfusion and medical microbiology.
A3. Aetiology, progression, and diagnosis of human diseases to support clinical management and treatment selection.
A4. Bioinformatic and statistical principles for analysis of big data for the study of genomics, proteomics and transcriptomics, and their application in precision medicine.
A5. Research design, quantitative/qualitative methods, critical review of evidence in the biomedical sciences, data interpretation, reporting, biosafety, ethics, and conduct.

B. Intellectual skills:

B1. Apply theories, paradigms, concepts, or subject-specific principles to a new context.
B2. Obtain and integrate lines of subject-specific evidence to formulate hypotheses, design experiments, critically evaluate data and use it to develop research proposal;
B3. Demonstrate independence of thought to identify the key features of a problem and suggest possible means of investigation.
B4. Keep abreast of current insights in core and specialist areas of biomedical science.
B5. Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.
B6. Synthesise, analyse and summarise a body of information and come to an informed and logically consistent conclusion.

C. Practical skills:

C1. Demonstrate competence in the basic experimental skills relevant to cell and molecular biology, genetics, human anatomy and physiology, medical microbiology, cellular pathology and imaging, clinical biochemistry and blood transfusion.
C2. Demonstrate knowledge of quality assurance and quality control principles, hazard identification, risk assessment and safety procedures associated with a particular technique or methodology.
C3. Select and apply appropriate techniques and evaluate alternative methodologies for an investigation or to complete a process.
C4. Undertake practical investigations in a responsible, safe and ethical manner, while observing relevant health and safety regulations.
C5. Organise and allocate duties, set targets and evaluate progress in achieving specific technical goals, evaluate own performance and performance of others within a team.
C6. Use relevant numerical quantitative techniques and demonstrate competence in bioinformatic and statistical methods to validate, calibrate and analyse big data.
C7. Present data in seminars or small-group tutorials to develop interpersonal skills such as information retrieval, problem-solving, communication and team working.

C8. Demonstrate competence in the use of word-processors, spreadsheets, biological databases and data presentation packages.

D. Transferrable skills:

D1. Identify individual and collective goals and responsibilities.
D2. Develop the ability to work on one's own initiative and manage one's own time to meet deadlines.
D3. Develop negotiation skills, and lifelong learning in the field of biomedical science including enterprise and knowledge transfer skills.
D4. Provide reflective and evidence-based solutions to problems.
D5. Recognise and respect the views and opinions of other team members.
D6. Evaluate their own performance as an individual and as a team member, as well as the performance of others.
D7. Develop a flexibe and effective approach to study and work.
D8. Communicate ideas, arguments and concepts in a rational and systematic way, using a variety of media.
D9. Clearly communicate in writing for both academic and lay audiences.
D10. Use the full range of sources of information, citing references properly and avoiding plagiarism.

Appendix B: Embedding the Educational Framework for Undergraduate Courses

The Educational Framework at London South Bank University is a set of principles for curriculum design and the wider student experience that articulate our commitment to the highest standards of academic knowledge and understanding applied to the challenges of the wider world.

The Educational Framework reflects our status as University of the Year for Graduate Employment awarded by *The Times and The Sunday Times Good University Guide 2018* and builds on our 125-year history as a civic university committed to fostering social mobility through employability and enterprise, enabling our students to translate academic achievement into career success.

There are four key characteristics of LSBU's distinctive approach to the undergraduate curriculum and student experience:

- Develop students' professional and vocational skills through application in industry-standard facilities
- Develop our students' graduate attributes, self-awareness and behaviours aligned to our EPIIC values
- Integrate opportunities for students to develop their confidence, skills, and networks into the curriculum
- Foster close relationships with employers, industry, and Professional, Statutory and Regulatory Bodies that underpin our provision (including the opportunity for internships, and professional opportunities)

The dimensions of the Educational Framework for curriculum design are:

- **informed by employer and industry** needs as well as professional, statutory, and regulatory body requirements
- **embedded learning development** for all students to scaffold their learning through the curriculum considering the specific writing and thinking requirements of the discipline/profession
- **high impact pedagogies** that enable the development of student professional and vocational learning through application in industry-standard or authentic workplace contexts
- **inclusive teaching, learning and assessment** that enables all students to access and engage the course
- **assessment for learning** that provides timely and formative feedback

All courses should be designed to support these five dimensions of the Educational Framework. Successful embedding of the Educational Framework requires a systematic approach to course design and delivery that conceptualises the student

experience of the curriculum as a whole rather than at modular level and promotes the progressive development of understanding over the entire course. It also builds on a well-established evidence base across the sector for the pedagogic and assessment experiences that contribute to high quality learning.
This appendix to the course specification document enables course teams to evidence how their courses meet minimum expectations, at what level where appropriate, as the basis for embedding the Educational Framework in all undergraduate provision at LSBU.

Dimension of the Educational Framework	**Minimum expectations and rationale**	**How this is achieved in the course**
Curricula informed by employer and industry need	<u>Outcomes focus and professional/employer links</u> All LSBU courses will evidence the involvement of external stakeholders in the curriculum design process as well as plan for the participation of employers and/or alumni through guest lectures or Q&A sessions, employer panels, employer-generated case studies or other input of expertise into the delivery of the course provide students with access to current workplace examples and role models. Students should have access to employers and/or alumni in at least one module at level 4.	The course has been informed by the QAA Biomedical Science Benchmarks (2019). Students are required to identify career opportunities in during a workshop at level 4 and during the Bioinformatics and Research Skills for Biomedical Scientists module at level 5, as part of their 'partnership' with the personal tutor. We will expose the students to skill requirements of employers via guest speakers, industrial visits, engagement with professional scientists. The employability in biomedicine, and Work experience modules will help students develop their professional skills in biomedical science.
Embedded learning development	<u>Support for transition and academic preparedness</u> At least two modules at level 4 should include embedded learning development in the curriculum to	Analytical thinking, critical reading and reflection are embedded in several modules at L4, for example Biology of the Cell and

	support student understanding of, and familiarity with, disciplinary ways of thinking and practising (e.g. analytical thinking, academic writing, critical reading, reflection). Where possible, learning development will be normally integrated into content modules rather than as standalone modules. Other level 4 modules should reference and reinforce the learning development to aid in the transfer of learning.	Microbiology. There is particular emphasis within Bioinformatics and Research Skills for Biomedical Scientists and the Research Project for Biomedicine modules on the development of a portfolio of learning and scientific practice. This will include basic scientific, mathematical and statistical techniques, communication skills, and ICT. Progression is made from level 4 and 5 to more in-depth data interpretation and use of more detailed analysis techniques via the Research Project module at level 6.
High impact pedagogies	<u>Group-based learning experiences</u> The capacity to work effectively in teams enhances learning through working with peers and develops student outcomes, including communication, networking and respect for diversity of perspectives relevant to **professionalism** and **inclusivity**. At least one module at level 4 should include an opportunity for group working. Group-based learning can also be linked to assessment at level 4 if appropriate. Consideration should be given to how students are allocated to groups to foster experience of diverse perspectives and values.	Projects and group work are facilitated in lectures, practical and tutorial sessions. These are not all formally assessed but serve as important components of students' experiential learning through peer learning, presentation, and communication skills. The development of the learning portfolio starts at the Biochemistry module, at level 4, through Bioinformatics and Research Skills for Biomedical Scientists at level 5. There is substantial opportunity for development of interpersonal skills in the final year Project as student's network with other stakeholder in the research process including external organisations.

Inclusive teaching, learning and assessment	<u>Accessible materials, resources and activities</u> All course materials and resources, including course guides, PowerPoint presentations, handouts and Moodle should be provided in an accessible format. For example, font type and size, layout and colour as well as captioning or transcripts for audio-visual materials. Consideration should also be given to accessibility and the availability of alternative formats for reading lists.	This is achieved via the Module Moodle and AULA sites. Staff will upload a range of learning resources to support student learning. All students enrolled on a module will have access to the Moodle/AULA site and all module materials.
Assessment *for* learning	<u>Assessment and feedback to support attainment, progression and retention</u> Assessment is recognised as a critical point for at risk students as well as integral to the learning of all students. Formative feedback is essential during transition into university. All first semester modules at level 4 should include a formative or low-stakes summative assessment (e.g. low weighted in final outcome for the module) to provide an early opportunity for students to check progress and receive prompt and useable feedback that can feed-forward into future learning and assessment. Assessment and feedback communicate high expectations and develops a commitment to **excellence**.	Students experience variety of assessments during their first year, including testing of their proficiency in Mathematics and in Biochemistry module, and as they commence the Bioinformatics and Research Skills for Biomedical Scientists at level 5. These modules provide a structure for greater use of formative or formative-to-summative assessment.
High impact pedagogies	<u>Research and enquiry experiences</u> Opportunities for students to undertake small-scale independent enquiry enable students to understand how knowledge is	Modules featuring research projects and practical activities include Biology of the Cell, Biochemistry, Genetics and Molecular

	generated and tested in the discipline as well as prepare them to engage in enquiry as a highly sought-after outcome of university study. In preparation for an undergraduate dissertation at level 6, courses should provide opportunities for students to develop research skills at level 4 and 5 and should engage with open-ended problems with appropriate support. Research opportunities should build student autonomy and are likely to encourage **creativity** and problem-solving. Dissemination of student research outcomes, for example via posters, presentations and reports with peer review, should also be considered.	Biology, Microbiology, Cellular Pathology and Imaging, Bioinformatics and Research Skills for Biomedical Scientists, Clinical Biochemistry and Blood Transfusion, as well as Clinical OMICS and Precision Medicine. Many of these knowledge and skills are brought together to complete the final year Project.
Curricula informed by employer and industry need / Assessment *for* learning	<u>Authentic learning and assessment tasks</u> Live briefs, projects or equivalent authentic workplace learning experiences and/or assessments enable students, for example, to engage with external clients, develop their understanding through situated and experiential learning in real or simulated workplace contexts and deliver outputs to an agreed specification and deadline. Engagement with live briefs creates the opportunity for the development of student outcomes including **excellence**, **professionalism**, **integrity** and **creativity**. A live brief is likely to develop research and enquiry skills and can be linked to assessment if appropriate.	There is substantial opportunity for development of professional skills in the final year dissertation as students liaise with support staff, subjects and outside bodies. The dissertation also furthers the skills of data collection, interpretation, and analysis, as well as presentation skills. Similar opportunities for development of lifelong learning, knowledge transfer, and negotiation skills exist in the employability and work experience modules.

Inclusive teaching, learning and assessment	<u>Course content and teaching methods acknowledge the diversity of the student cohort</u> An inclusive curriculum incorporates images, examples, case studies and other resources from a broad range of cultural and social views reflecting diversity of the student cohort in terms of, for example, gender, ethnicity, sexuality, religious belief, socio-economic background etc. This commitment to **inclusivity** enables students to recognise themselves and their experiences in the curriculum as well as foster understanding of other viewpoints and identities.	Staff use a range of materials in the delivery of their courses that include images and video. Consideration is also given to cultural, religion and gender diversity.
Curricula informed by employer and industry need	<u>Work-based learning</u> Opportunities for learning that is relevant to future employment or undertaken in a workplace setting are fundamental to developing student applied knowledge as well as developing work-relevant student outcomes such as networking, **professionalism** and **integrity**. Work-based learning can take place within the work experience and employability modules as well as, for example, case studies, simulations and role-play in clinical- or industry-standards settings as relevant to the course. Work-based learning can be linked to assessment if appropriate.	Students are required to identify career opportunities during the career workshop planned at level 4, and in Bioinformatics and Research Skills for Biomedical Scientists as part of their 'partnership' with the personal tutor at level 5. Students will participate in clinical and industrial visits in a wide sense and network with professional scientists at level 5 and 6. Students will also be encouraged to participate in the University Ambassador scheme.
Embedded learning development	<u>Writing in the disciplines: Alternative formats</u> The development of student awareness, understanding and mastery of the specific thinking and communication practices in	Students are required to develop a learning portfolio as part of the outcomes from the Bioinformatics and Research Skills for Biomedical Scientists module

	the discipline is fundamental to applied subject knowledge. This involves explicitly defining the features of disciplinary thinking and practices, finding opportunities to scaffold student attempts to adopt these ways of thinking and practising and providing opportunities to receive formative feedback on this. A writing in the disciplines approach recognises that writing is not a discrete representation of knowledge but integral to the process of knowing and understanding in the discipline. It is expected that assessment utilises formats that are recognisable and applicable to those working in the profession. For example, project report, presentation, poster, lab or field report, journal or professional article, position paper, case report, handbook, exhibition guide.	at level 5. This facilitates development of scientific writing, practical reporting and research skills, and provides students with opportunities to develop their writing in literature review, research proposal, and ethics application. The final year Project requires students to develop skills in scientific write-up and presentation and discussion of results.
High impact pedagogies	<u>Multi-disciplinary, interdisciplinary or interprofessional group-based learning experiences</u> Building on experience of group working at level 4, at level 5 students should be provided with the opportunity to work and manage more complex tasks in groups that work across traditional disciplinary and professional boundaries and reflecting interprofessional work-place settings. Learning in multi- or interdisciplinary groups creates the opportunity for the development of student outcomes including **inclusivity**, communication and networking.	This is achieved in the degree programme through assessments that requires students to work in groups on mini research projects and laboratory assessments. The final year project encourages students to carry out an interdisciplinary research investigation linked either to the research interests of the academic team or, with approval from an academic, their own research question.

Assessment *for* learning	<u>Variation of assessment</u> An inclusive approach to curriculum recognises diversity and seeks to create a learning environment that enables equal opportunities for learning for all students and does not give those with a particular prior qualification (e.g. A-level or BTEC) an advantage or disadvantage. An holistic assessment strategy should provide opportunities for all students to be able to demonstrate achievement of learning outcomes in different ways throughout the course. This may be by offering alternate assessment tasks at the same assessment point, for example either a written or oral assessment, or by offering a range of different assessment tasks across the curriculum.	A variety of assessment is used at level 4, including essays, problem solving exercises, Moodle quizzes, and unseen written exams. Thereafter, level 5 and 6 assessment is a combination of examination, a variety of coursework, including presentations, essays, case studies, in-class tests, and a final year dissertation.
Curricula informed by employer and industry need	<u>Career management skills</u> Courses should provide support for the development of career management skills that enable students to be familiar with and understand relevant industries or professions, be able to build on work-related learning opportunities, understand the role of self-appraisal and planning for lifelong learning in career development, develop resilience and manage the career building process. This should be designed to inform the development of **excellence** and **professionalism**.	Students are required to identify career opportunities during the annual employability workshop provided at level 4, and in the Bioinformatics and Research Skills for Biomedical Scientists as part of their 'partnership' with the personal tutor. Modules at level 5 and 6 will develop the students' skills as reflective practitioners and encourage their career planning. Students will participate in industrial visits in a wide sense and network with professional scientists at level 5 and 6.

Curricula informed by employer and industry need / Assessment *for* learning / High impact pedagogies	Capstone project/dissertation The level 6 Research Project or dissertation is a critical point for the integration and synthesis of knowledge and skills from across the course. It also provides an important transition into employment if the assessment is authentic, industry-facing or client-driven. It is recommended that this is a capstone experience, bringing together all learning across the course and creates the opportunity for the development of student outcomes including **professionalism**, **integrity,** and **creativity**.	The final year Project requires students to develop skills in: (1) Identification of the significance of research and formulation of hypotheses. (2) Design, justification and implementation of approaches to testing (giving consideration to sample population, reliability, validity and statistical analysis); (3) Scientific write-up, presentation and discussion of results. (4) Maintaining contemporaneous records and notes. (5) Presentation and defending their results via a *viva voce*.

Appendix C: Terminology

The following is a list of terminologies used in the context of the BSc (Hons) Biomedical Science Course:

Awarding body	a UK higher education provider (typically a university) with the power to award higher education qualifications such as degrees
Bursary	a financial award made to students to support their studies; sometimes used interchangeably with 'scholarship'
Collaborative provision	a formal arrangement between a degree-awarding body and a partner organisation, allowing for the latter to provide higher education on behalf of the former
Compulsory module	a module that students are required to take
Contact hours	the time allocated to direct contact between a student and a member of staff through, for example, timetabled lectures, seminars
Coursework	student work that contributes towards the final result but is not assessed by written examination

Current students	students enrolled on a course who have not yet completed their studies or
Delivery organisation	an organisation that delivers learning opportunities on behalf of a degree-awarding body
Distance-learning course	a course of study that does not involve face-to-face contact between students and tutors
Extracurricular	activities undertaken by students outside their studies
Feedback (on assessment)	advice to students following their completion of a piece of assessed or examined work.
Formative assessment	a type of assessment designed to help students learn more effectively, to progress in their studies and to prepare for summative assessment; formative assessment does not contribute to the final mark, grade or class of degree awarded to students
Higher education provider	organisations that deliver higher education.
Independent learning	learning that occurs outside the classroom that might include preparation for scheduled sessions, follow-up work, wider reading or practice, completion of assessment tasks, or revision
Lecture	a presentation or talk on a particular topic. in general lectures involve larger groups of students than seminars and tutorials
Learning zone	a flexible student space that supports independent and social earning
Material information	information students need to make an informed decision, such as about what and where to study
Mode of study	different ways of studying, such as full-time, part-time, e-learning or work-based learning
Modular course	a course delivered using modules
Module	a self-contained, formally structured unit of study, with a coherent and explicit set of learning outcomes and assessment criteria; some providers use the word 'course' or 'course unit' to refer to individual modules
National teaching fellowship	a national award for individuals who have made an outstanding impact on student learning and the teaching profession

Optional module	a module or course unit that students choose to take
Professional body	an organisation that oversees the activities of a particular profession and represents the interests of its members
Prospective student	those applying or considering applying for any programme, at any level and employing any mode of study, with a higher education provider
Regulatory body	an organisation recognised by government as being responsible for the regulation or approval of a particular range of issues and
Scholarship	a type of bursary that recognises academic achievement and potential, and which is sometimes used interchangeably with
Semester	either of the parts of an academic year that is divided into two for purposes of teaching and assessment (in contrast to division into terms)
Seminar	seminars generally involve smaller numbers than lectures and enable students to engage in discussion of a particular topic and/or to explore it in more detail than might be covered in a lecture
Summative assessment	formal assessment of students' work, contributing to the final result
Term	any of the parts of an academic year that is divided into three or more for purposes of teaching and assessment (in contrast to division into semesters)
Total study time	the total time required to study a module, unit or course, including all class contact, independent learning, revision and assessment
Tutorial	one-to-one or small group supervision, feedback or detailed discussion on a particular topic or project
Work/study placement	a planned period of experience outside the institution (for example, in a workplace or at another higher education institution) to help students develop particular skills, knowledge or understanding as part of their course
Written examination	a question or set of questions relating to a area of study to which candidates write answers usually (but not always) under timed conditions