

Programme Specification

1	Awarding body	University of London
2	Teaching Institution	Birkbeck College
3	Programme Title(s)	MSci Biomedicine with Advanced Pathways: <ul style="list-style-type: none"> • Biochemical Analysis • Microbiology • Structural Molecular Biology
4	Programme Code(s)	UUBMMOBI_C (4-year, FT)
5	UCAS code	C702
6	Home Department	Biological Sciences
7	Exit Award(s)	BSc (Hons) Biomedicine; Diploma of Higher Education (DipHE) Biomedicine; Certificate of Higher Education (CertHE) Biomedicine; Certificate of Continuing Education (CCE)
8	Duration of Study (number of years)	MSci – 4 years; BSc – 3 years; DipHE – 2 years; CertHE - 1 year; CCE - 1 year
9	Mode of Study	Full-time
10	Level of Award (FHEQ)	7
11	Other teaching depts or institutions	None
12	Professional, Statutory Regulatory Body (PSRB) details	N/A
13	<u>QAA Benchmark Group</u>	N/A

14	Programme Rationale & Aims
	<p>A rational approach to the development of treatments for current and emerging threats to human well-being depends upon a sound knowledge of human health and disease. Biomedicine is at the interface between molecular, cell and integrative biology and evolving disease therapies, whilst biomedical research plays a pivotal role in the transfer of advances in basic science into effective practices that promote human health as well as into treatments for human diseases. Years 1 through 3 of this programme will provide you with a sound understanding of the science that underpins modern medical practice, and of how this may be applied to the investigation, diagnosis and treatment of human disease.</p> <p>Advanced pathways, offered by this programme as Year 4, offer students the opportunity to follow their interests in one of two main directions: 1) toward a more thorough knowledge of the chemical and physical principles that govern the structure and behaviour of biomolecules (Biochemical Analysis pathway or Structural Molecular Biology pathway); or 2) toward advanced training in specific scientific techniques appropriate to the research microbiologist.</p>

	<p>Overall, this integrated master's programme will provide you with the knowledge, skills, and hands-on research experience that will help you to launch your career in exciting areas of research science, including basic biotechnology, diagnostics and forensics, drug discovery, or in other related disciplines.</p> <p>Main Aims</p> <ul style="list-style-type: none"> • To develop students' understanding of the molecular and biochemical underpinnings of cellular and organismal functioning. • To produce graduates having the knowledge, analytical skills and practical skills essential for further study in relevant scientific disciplines and/or for employment. • To provide students currently in science-related work with additional skills and academic knowledge for career enhancement and/or vocational realignment. <p>Distinctive Features</p> <ul style="list-style-type: none"> • Evening, face-to-face study, at full-time intensity. • Choice of named Advanced Pathway, based on composition of the Masters Level year of study (Year 4). • Flexible provision with the possibility of decelerating your pace of study toward the MSci, or reverting to a BSc, if desired. • Convenient stopping-off points providing named awards should circumstances prevent completion of the programme.
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15	<p>Entry Criteria</p> <p>Applicants are normally expected to have gained 120 UCAS tariff points (e.g. BBB at A-Level) with a majority of science-related subjects (biology, chemistry and/or mathematics or physics). A-levels in general studies and critical thinking are not accepted. In addition, we require GCSEs in English, Mathematics, and Double Science (or two single sciences), all at grade C or better.</p> <p>We are committed to making the biological sciences accessible to students from a wide range of backgrounds and with diverse career aspirations.</p>
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16	<p>Learning Outcomes</p> <p><i>On successful completion of this programme, you should be able to demonstrate:</i></p> <p>A. Knowledge and Understanding</p> <ol style="list-style-type: none"> 1- A sound knowledge and understanding of scientific principles essential for the investigation and understanding of human disease, acquired through study across a range of disciplines, including: biochemistry, cell biology, chemistry, genetics, immunology, microbiology, molecular biology, physiology, and pharmacology; 2- a knowledge of how these disciplines may be applied toward an understanding molecular mechanisms of cellular function and dysfunction, and in discovery and development of novel bioactive molecules; 3- subject-specific knowledge within the areas of: biochemistry and molecular biology (enzymes, metabolic systems; nucleic acid manipulation, genomics); cell biology (cell structure, cell division, differentiation; microbiology); genetics (principles of evolution; inheritance, differential gene expression); homeostasis and cell
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communication (feedback control and cell signalling); human systems physiology (major organ systems; immunity; aspects of disease processes); basic principles of pharmacology and drug actions;

- 4 for a range of human diseases, a critical understanding of their molecular and cellular basis, and of their diagnosis and treatment;
- 5- awareness and engagement with philosophical and ethical issues arising from some of the current developments in the bio-molecular and biomedical sciences;
- 6- a critical understanding of how the chemistry and structure of the major biological macromolecules determines their biological functioning and their interactions with other chemical entities;
- 7- a critical understanding of recent advances in fields of study relating to their chosen advanced pathway/research area.

B. Intellectual Skills

- 8- Application of subject-specific knowledge and understanding in addressing and solving familiar and unfamiliar problems;
- 9- analysis, critical evaluation and synthesis of scientific evidence, concepts and principles;
- 10- an ability to formulate research questions and to test and evaluate hypotheses using principled experimental design;
- 11- development of strategies for updating, maintaining and enhancing your knowledge of the science underpinning new advances in the bio-molecular sciences;
- 12- independent reasoning and defence of ideas.

C. Practical Skills

- 13- Appreciation and application of safe working practices in a scientific laboratory;
- 14- an ability to apply relevant numerical skills, including statistics, in analysing molecular/biochemical data;
- 15- skill in executing a range of analytical/experimental laboratory methodologies, and an understanding of the principles upon which these methodologies are based;
- 16- a critical approach in scientific enquiry through the execution and reporting of research projects.

D. Transferable Skills

- 17- Personal responsibility for your learning, and habits of reflection on that learning;
- 18- an ability to identify, retrieve (e.g. through online computer searches and other means), sort and exchange information;
- 19- skill in abstracting and synthesising information, and developing a reasoned argument;
- 20- effective written communication and oral presentation to specialist and non-specialist audiences;
- 21- use of information technology (including spreadsheets, databases, word processing, email and web-based resources);

	<p>22- effective interpersonal skills, including working in groups/teams and recognising and respecting the viewpoints of others.</p> <p>23- the ability to undertake further training and develop new skills within a structured and managed environment;</p> <p>24- the ability to communicate the results of their study/work accurately and reliably, and with structured and coherent arguments.</p>
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17	<p>Learning, teaching and assessment methods</p>
	<p>All modules are taught by academic staff engaged with current topics in biomedicine. We provide a range of teaching approaches and learning experiences that will enable you to become a confident and autonomous learner. You will develop the skills to work either independently or within a group, as required by the task at hand.</p> <p>Our strategy across the programme is to progressively immerse and engage learners in topics and activities of increasing complexity, building subject-matter and skills foundations at each level so to provide an opportunity for success at the next level.</p> <p>The forms of assessment and the specific tasks these require give due consideration to developing and testing the relevant practical/scientific and transferable skills, and to developing your abilities and academic potential, whilst acknowledging the diverse educational backgrounds and life experiences brought by all of our students. We incorporate research-oriented activity throughout the programme, again with careful consideration of its appropriateness to subject matter and academic level.</p> <p>Classroom teaching is through combinations of lectures, laboratory sessions, computer exercises, and seminars in proportions appropriate to the academic level and the demands of the topic. Each year of the programme includes significant hands-on laboratory training, culminating in the conduct of novel research in the final year. Thus the MSci research project provides the opportunity to gain in-depth training in specialist and advanced methods in world-class research laboratories, under the tutelage of leading experts.</p> <p>Within classroom sessions, teaching and learning will be enhanced by regular formative assessment that will challenge your knowledge and understanding of topics under study. Such informal assessment may include engaging in discussions and/or solving problems in class, designing and executing your own laboratory investigations, engaging in peer assessment, and/or responding to the instructor's questioning, perhaps through an electronic voting ("clicker") system. Your learning will be supplemented and reinforced through guided independent study, undertaken outside of class; this study will be facilitated through a range of online materials delivered via our virtual learning environment (Moodle). You will receive skills training (e.g. laboratory skills, IT skills, numeracy, communications skills, etc.) throughout the programme and in-context with relevant subject matter.</p> <p>Summative assessment (used in determining module grades) in your modules may include in differing combinations: short-answer tests (in-class); computer-based tests (accessed remotely or in-class); practical reports; essays; problem-solving and data analysis assignments; oral communication and poster presentations; internet surveys; and unseen, or open-book, written examinations. The mix of assessment types, and the specific tasks required, are matched to the academic level and to the learning outcomes of the module.</p>

	<p>Each module has a syllabus (supplied to enrolled students) that provides details of the learning outcomes and assessment regime for that module.</p> <p>Departmental Teaching Committees continually review all learning, teaching and assessment arrangements to ensure the programme and its modules maintain coherence, currency, and operates at an appropriate standard. Such review is informed by feedback from students and from an External Examiner who visits annually to review our courses and conduct exit interviews with students.</p>
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18	<p>Programme Description</p>
	<p>The MSci Biomedicine with Advanced Pathways is built from modules to the value of 480 credits, with 120 credits at each Level of study.</p> <p>Years 1 through 3 of the programme (360 credits) are identical to the BSc Biomedicine (Levels 4, 5 and 6; undergraduate honours). To this point, all modules are required.</p> <p>Year 4, with 120 credits at Level 7 (Masters), confers the MSci designation, with the Advanced Pathway name appended to the award title. All students will undertake a research project, contributing 60 credits, in the final year of the programme. The remaining 60 credits may be earned by completing <u>one</u> of three optional Advanced Pathways, listed below and described in the Programme Structure section.</p> <p><u>1</u>: <i>MSci Biomedicine with Biochemical Analysis</i></p> <p><u>2</u>: <i>MSci Biomedicine with Microbiology</i></p> <p><u>3</u>: <i>MSci Biomedicine with Structural Molecular Biology</i></p> <p>The Advanced Pathway will be selected to align with the content of the research project. Details of the final year of the programme will be agreed at the end of Year 3, with the assistance of the Programme Director and the Project Supervisor(s).</p> <p>As described above, the programme will span 4 academic years of full-time study. Applicants should note that they will be obliged to undertake some academic work in the summer vacations between terms, and that some of this is specifically timetabled. In particular, just prior to Year 3, the <i>Specialist Laboratory Research Project</i> requires attendance for a full-time week (M-F), in the daytime (ca. 1000 to ca. 1800 h). This normally takes place in mid- to late-September. Additionally, although it has no timetabled sessions outside of terms, students must be prepared to begin working on the <i>Research Project MSci Biomedicine</i> during the summer vacation between Years 3 and 4. Additionally, applicants should be aware that for some module selections, the final exam for the module concerned may be held as late as September, following the end of the 4th academic year.</p>

19	Programme Structure			
4 YEAR FULL-TIME PROGRAMME				
Year 1 (120 credits)				
Level	Module Code	Module Title	Credits	Status*
4	SCBS064H4	Introduction to Molecular Cell Biology	15	Compulsory
4	SCBS065H4	Practical Skills for the Biosciences	15	Compulsory
4	SCBS066H4	General Chemistry	15	Compulsory
4	SCBS067H4	Cell Membranes and Bioenergetics	15	Compulsory
4	SCBS068H4	Quantitative Skills and Experimental Design	15	Compulsory
4	SCBS069H4	Organic and Biological Chemistry	15	Compulsory
4	SCBS070H4	Introduction to Nutrition and Metabolism	15	Compulsory
4	SCBS071H4	Laboratory Skills in Biochemistry	15	Compulsory
Year 2 (120 credits)				
Level	Module Code	Module Title	Credits	Status*
5	SCBS072H5	Research Methods in the Biosciences	15	Compulsory
5	SCBS073H5	Evolution and Genetics	15	Compulsory
5	SCBS074H5	Metabolic Challenges in Health and Disease	15	Compulsory
5	SCBS075H5	Medical Microbiology and Immunology	15	Compulsory
5	SCBS076H5	Aspects of Human Physiology	15	Compulsory
5	SCBS077H5	Molecular Biology	15	Compulsory
5	SCBS078H5	Protein Structure and Function	15	Compulsory
5	SCBS079H5	Drugs and Drug Discovery	15	Compulsory
Year 3 (120 credits)				
Level	Module Code	Module Title	Credits	Status*
6	BCBC006S6	Advanced Cell Biology	30	Compulsory
6	SCBS080H6	Infectious Bacteria and Antibiotics	15	Compulsory
6	SCBS081H6	Advanced Topics in Human Disease	15	Compulsory
6	SCBS036D6	^Specialist Laboratory Research Project	60	Compulsory
^ As well as evening attendance throughout the academic year, SLRP includes required attendance at a 1-week, daytime, pre-term "boot camp", normally in September.				

Status*

CORE – Module must be taken and passed by student

COMPULSORY – Module must be taken, mark can be reviewed at sub-exam board

OPTIONAL – Student can choose to take this module

See next page for Year 4

Year 4 (120 credits)				
Level	Module Code	Module Title	Credits	Status*
7	SCBS053D7	Research Project MSci Biomedicine	60	Core
<p>This module runs across all 3 terms of study.</p> <p>In addition to the Research Project, in consultation with the Programme Director and Project Supervisor at the end of Year 3, students will elect to undertake one of 3 optional routes. Each comprises 60 credits at Level 7, as listed below. The Advanced Pathway chosen will be based on which module(s) best supports the demands of the student's research project.</p> <p>The Advanced Pathway selected will determine the award title, as seen in the headings below.</p> <p>Note that the Research Skills module, which runs in Term 1, is common to all 3 pathways. The pathway-defining modules each run in Term 2.</p>				
<p>Advanced Pathway 1 Leading to the award of MSci Biomedicine with Biochemical Analysis</p>				
7	SCBS089S7	Research Skills and Statistics	30	Compulsory
7	SCBS090S7	Biochemical Analysis	30	Compulsory
<p>Advanced Pathway 2 Leading to the award of MSci Biomedicine with Microbiology</p>				
7	SCBS089S7	Research Skills and Statistics	30	Compulsory
7	SCBS091S7	Cellular Microbiology	30	Compulsory
<p>Advanced Pathway 3 Leading to the award of MSci Biomedicine with Structural Molecular Biology</p>				
7	SCBS089S7	Research Skills and Statistics	30	Compulsory
7	SCBS092S7	Molecular and Cellular Structure Determination	30	Compulsory
<p>To complete the Research Project MSci Biomedicine will require that students begin academic work during the summer vacation before entering Year 4. Beyond that, the project will require daytime availability, for up to 5 days per week at times, throughout the academic year.</p>				

Status*

CORE – Module must be taken and passed by student

COMPULSORY – Module must be taken, mark can be reviewed at sub-exam board

OPTIONAL – Student can choose to take this module

20	<p>Additional Programme Information</p> <p>Progression requirements: Progression from the Level 6 year to the Level 7 year requires that candidates will have accumulated 360 credits from the BSc Biomedicine and that their weighted average mark from the BSc modules minimally places them in the 2.1 Honours class. Should a candidate fail to meet this threshold, they will be required to exit with the earned BSc award.</p> <p>Transfer to MSci from BSc: Having completed BSc Year 2 (Level 5; 240 credits accumulated), students in good standing on the BSc Biomedicine may apply to transfer to Year 3 of the MSci. Only students who have achieved a weighted average in Level 5 modules of at least 65% will be considered for transfer. We would apply the same</p>
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	threshold in considering transfer applicants from relevant programmes at other universities. Applications for transfer to Year 4 of the MSci will not be considered.
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21	Programme Director	Dr Katherine Thompson
22	Start Date (<i>term/year</i>)	Autumn Term (Sept) 2018
23	Date approved by TQEC	Autumn 2017
24	Date approved by Academic Board	Autumn 2017
25	Date(s) updated/amended	July 2022. To revise structure of Y4