Year of entry: 2022/23

Programme Specification

1	**Awarding body**	University of London						
2	**Teaching Institution**	**Birkbeck College**						
3	**Programme Title(s)**	**MSc Analytical Bioscience** **PG Dip Analytical Bioscience**						
4	**Programme Code(s)**	TMSABIOS_C TPDABIOS_C						
5	**UCAS code**	N/A						
6	**Home Department**	Biological Sciences						
7	**Exit Award(s)**	PG Dip, PG Cert Alternative exit award of *MSc Biological Sciences* awarded for any 180 credits at level 7 from modules in home department (limited to a max. of one project module).						
8	**Duration of Study** (number of years)	MSc full-time: normally 1 year MSc part-time: normally 2 years PG Diploma full time: normally 1 year PG Diploma part-time: normally 2 years						
9	**Mode of Study**	FT	**X**	PT	**X**	DL		
10	**Level of Award (FHEQ)**	7						
11	**Other teaching depts or institution** ***(or not applicable)***	N/A						
12	**Professional, Statutory Regulatory Body(PSRB) details** ***(or not applicable)***	N/A						
13	**QAA Benchmark Statement**	N/A						

14	**Programme Rationale & Aims**
	The Analytical Bioscience programmes (MSc and PG Dip) aim to provide excellent training and education in the core knowledge and skills required by scientists concerned with the analysis of chemical and bio-chemical substances at the interface of chemistry and biology. The MSc consists of a combination of taught modules and a research project in Analytical Bioscience. The programme covers 1) the core areas of analytical chemistry needed to study biological molecules taught in a face-to-face environment with a focus on hands-on practical and instrumentation work, 2) the chance to select two optional modules from a range of choices covering different methods to determine and analyse protein structures taught by distance learning with tutorials and 3) a research project in one of the excellent research labs in Birkbeck, within the wider Institute of Structural Molecular Biology or, if appropriate, at the students place of work (for part-time students). Students on the Post-Graduate Diploma programme take any 120 credits from the MSc programme. The programme's blended learning model makes it very flexible in terms of attendance whilst offering hands-on experience in world-class research labs.

	The training includes the essential tools of bio-analytical science and their appropriate application. The key aims are to provide: • An understanding of the science underlying key areas of bio-analytical methodology and its practical applications. • An in-depth understanding in at least one specialised area in the discipline. • Experience with a range of chemical and biochemical manipulations and instrumentation. • Skills training in the analysis of complex sets of data. • Practice in the written and oral presentation of information. • Use of computers in analysing molecular structures, searching for information, in the analysis of data, and preparation of reports. • A critical and professional approach to quality in analytical science.

15	**Entry Criteria**
	Good honours degree in a scientific subject. Less-qualified students may be accepted if they have appropriate work experience, or through registration on the Postgraduate Diploma with the possibility of upgrading to the MSc after achieving appropriate results in the first set of examinations.

16	**Learning Outcomes**
	On successful completion of this programme a student will be expected to be able to: **Subject specific learning outcomes** 1) Demonstrate a sound knowledge and understanding of the science underlying the key areas of bio-analytical methodology and its practical applications. 2) Show a critical understanding of recent advances in their field of study. 3) Critically assess current literature in the discipline. 4) Formulate a research or method development plan and carry out the appropriate literature and data searches. 5) Demonstrate a critical and professional approach to quality of analysis. **Intellectual learning outcomes** 6) Select the most appropriate analytical method. 7) Analyse a wide range of data types. 8) Show critical reasoning. 9) Gather and evaluate information. 10) Solve problems. 11) Formulate and test basic hypotheses. 12) Show independent reasoning and defense of ideas. **Practical learning outcomes** 13) Carry out chemical and bio-chemical manipulations and operate advanced analytical equipment.

14) Work safely and efficiently in a laboratory.
15) Access a variety of subject-specific and more generic databases and information sources.
16) Use molecular visualisation tools.
17) Apply skills to practical problems and, where appropriate develop new skills.
18) Use different forms of IT confidently.

Personal and social learning outcomes

19) Work as part of a team both in person and *via* virtual interaction.
20) Manage time efficiently to balance the face-to-face and distance learning aspects of the programme.
21) Present and communicate material and ideas in both written (including electronic communication) and oral formats.
22) Learn independently.
23) Show a professionalism in their approach to bio-analytical work.

17	**Learning, teaching and assessment methods**

Learning is simulated by the use of a range of teaching and assessment methods. Methods used include: tutorials, formal lectures, problem classes, computer based problems, computer aided learning, laboratory assignments and distance learning of the specialist topics. The underlying principles of the core topics are reinforced by considerable time spent performing a wide range of analysis methods in the laboratory, thus also developing practical laboratory and data analysis skills. The hands-on research project provides the opportunity to gain in-depth training in specialist and advanced methods either in world-class research laboratories or industry.

A variety of assessment methods are used. The taught modules are mostly assessment by a combination of unseen written examination and coursework, striking a balance between assessing knowledge, understanding and skills. The coursework includes a wide and varied range of activities such as practical work, presentations, essays, assignments, in-class tests and computer based analysis but this list is not exhaustive.

The research project is assessed by a written report, oral presentation and poster presentation.

The pass mark for all modules is 50% overall with no minimum mark for the individual elements of the assessment for the module.

18	**Programme Description**

The Analytical Bioscience programme aims to provide students with a comprehensive training in the analysis of biological molecules, covering a wide range of analytical techniques with hands-on experience and a project in one of our excellent research laboratories. The programme is very flexible and is based around three components:

1) Four 15-credit modules taught face-to-face (total 60 credits). The lectures are held during the afternoon (2- 5 pm) or evening (6 – 9 pm) on a Monday and a Wednesday

during the Autumn and Spring terms. Students must also complete a number of laboratory practicals associated with these modules.

2) Two 30-credit distance learning modules. Students should allow between 8 – 12 hours of study per week for these modules.
3) A research project (60 credits). Students must agree with their supervisor when to work on the project. They should spend roughly one third of their time in total on this component.

Full-time MSc students take all three components, as above, in one year. A full-time student is expected to devote around 40 hours a week to their MSc studies.

Part-time MSc students usually complete two of the face-to-face 15-credit modules in year 1 plus the one 30-credit, distance learning module and begin work on their research project. In year 2 they take a further two face-to-face 15-credit modules, a second 30-credit distance learning module and complete their research project. The timing of the face-to-face modules alternates yearly between afternoon and evening slots so part-time students can attend during the evening only (6 - 9 pm) over two years to complete the MSc.

To be awarded an MSc a student must successfully obtain 180 credits. **A Post-Graduate Diploma** is awarded for successful completion of any two of the above three components (120 credits). A **Post-Graduate Certificate** may be awarded for successful completion of 60 credits of taught courses BUT the successful completion of the Research Project alone does not lead to an award.

19 **Programme Structure**

Full Time programme

Year 1 (Full time programme is completed in one year)

Level	Module Code	Module Title	Credits	Status*
7	SCBS009H7	NMR Spectroscopy and Mass Spectrometry	15	COMPULSORY
7	SCBS006H7	Separation Science	15	COMPULSORY
7	SCBS024D7	Analytical Bioscience Research Project	60	COMPULSORY
7	SCBS008H7	Optical Spectroscopy and Atomic Spectrometry	15	COMPULSORY
7	SCBS010H7	Techniques in Clinical Analysis	15	COMPULSORY
		And any TWO of:		
7	SCBS058S7	Protein Expression and Purification	30	OPTIONAL
		or		
7	SCBS057S7	Protein Structure Determination	30	OPTIONAL
		or		
7	SCBS061S7	Macromolecular and Cellular Electron Microscopy	30	OPTIONAL
		or		
7	SCBS060S7	Protein Crystallography	30	OPTIONAL
		or		
7	SCBS056S7	Principles of Protein Structure	30	OPTIONAL
		or		
7	SCBS059S7	Protein Bioinformatics	30	OPTIONAL

Part Time programme				
Year 1 ODD YEARs (i.e. for students starting in 2021/22 or 2023/24)				
Level	**Module Code**	**Module Title**	**Credits**	**Status***
7	SCBS009H7	NMR Spectroscopy and Mass Spectrometry	15	COMPULSORY
7	SCBS006H7	Separation Science	15	COMPULSORY
		and any ONE of		
7	SCBS058S7	Protein Expression and Purification	30	OPTIONAL
		or		
7	SCBS057S7	Protein Structure Determination	30	OPTIONAL
		or		
7	SCBS061S7	Macromolecular and Cellular Electron Microscopy	30	OPTIONAL
		or		
7	SCBS060S7	Protein Crystallography	30	OPTIONAL
		or		
7	SCBS056S7	Principles of Protein Structure	30	OPTIONAL
		or		
7	SCBS059S7	Protein Bioinformatics	30	OPTIONAL
Year 1 EVEN YEARs (i.e. for students starting in 2020/21 or 2022/23)				
Level	**Module Code**	**Module Title**	**Credits**	**Status***
7	SCBS008H7	Optical Spectroscopy and Atomic Spectrometry	15	COMPULSORY
7	SCBS010H7	Techniques in Clinical Analysis	15	COMPULSORY
		and any ONE of		
7	SCBS058S7	Protein Expression and Purification	30	OPTIONAL
		or		
7	SCBS057S7	Protein Structure Determination	30	OPTIONAL
		or		
7	SCBS061S7	Macromolecular and Cellular Electron Microscopy	30	OPTIONAL
		or		
7	SCBS060S7	Protein Crystallography	30	OPTIONAL
		or		
7	SCBS056S7	Principles of Protein Structure	30	OPTIONAL
		or		
7	SCBS059S7	Protein Bioinformatics	30	OPTIONAL
Year 2 EVEN YEARS (i.e. for students entering year 2 in 2020/21 or 2022/23)				
7	SCBS024D7	Analytical Bioscience Research Project	60	COMPULSORY
7	SCBS008H7	Optical Spectroscopy and Atomic Spectrometry	15	COMPULSORY
7	SCBS010H7	Techniques in Clinical Analysis	15	COMPULSORY
		and any ONE of		
7	SCBS058S7	Protein Expression and Purification	30	OPTIONAL
		or		
7	SCBS057S7	Protein Structure Determination	30	OPTIONAL
		or		

7	SCBS061S7	Macromolecular and Cellular Electron Microscopy	30	OPTIONAL
		or		
7	SCBS060S7	Protein Crystallography	30	OPTIONAL
		or		
7	SCBS056S7	Principles of Protein Structure	30	OPTIONAL
		or		
7	SCBS059S7	Protein Bioinformatics	30	OPTIONAL
Year 2 ODD YEARS (i.e. for students entering year 2 in 2021/22 or 2023/24)				
7	SCBS024D7	Analytical Bioscience Research Project	60	COMPULSORY
7	SCBS009H7	NMR Spectroscopy and Mass Spectrometry	15	COMPULSORY
7	SCBS006H7	Separation Science	15	COMPULSORY
		and any ONE of		
7	SCBS058S7	Protein Expression and Purification	30	OPTIONAL
		or		
7	SCBS057S7	Protein Structure Determination	30	OPTIONAL
		or		
7	SCBS061S7	Macromolecular and Cellular Electron Microscopy	30	OPTIONAL
		or		
7	SCBS060S7	Protein Crystallography	30	OPTIONAL
		Or		
7	SCBS056S7	Principles of Protein Structure	30	OPTIONAL
		or		
7	SCBS059S7	Protein Bioinformatics	30	OPTIONAL

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	**Programme Director**	Dr Katherine Thompson
21	**Start Date** ***(term/year)***	Autumn 2010
22	**Date approved by TQEC**	Spring 2010
23	**Date approved by Academic Board**	Summer 2010
24	**Date(s) updated/amended**	**08 July 2020:** Added additional exit award of MSc Biological Sciences