Programme Specification

1	**Awarding body**	University of London
2	**Teaching Institution**	**Birkbeck College**
3	**Programme Title(s)**	**MRes Bioinformatics**
4	**Programme Code(s)**	TMRBIOTC_C
5	**UCAS code**	N/A
6	**Home Department**	School of Biological Sciences
7	**Exit Award(s)**	PG Cert
8	**Duration of Study** (number of years)	FT 1 year; PT 2 years
9	**Mode of Study**	FT		PT		DL	**Online delivery- FT & PT**
10	**Level of Award (FHEQ)**	7
11	**Other teaching depts or institution**	N/A
12	**Professional, Statutory Regulatory Body(PSRB) details**	N/A
13	**QAA Benchmark Statement**	N/A

14	**Programme Rationale & Aims**

The rationale for the course is to combine high-quality postgraduate training in bioinformatics with a major research component. The programme is particularly suitable for students wishing to progress to do a PhD in computational biology.

The specific aims of the course are to provide graduate students with:

- An understanding of bioinformatics together with the analytical skills (both theoretical and practical) relevant to this field.

- A general training in bioinformatics that meets clear industrial and academic needs to support and advance biotechnology and bioinformatics research and development, including emerging areas with acknowledged skills shortages (such as the analysis of Next Generation Sequencing data).

- The ability to apply the tools and techniques of computer science, biology, chemistry, and statistics to obtain information from the vast wealth of biological data that can be accessed via the internet. The key emphasis is on acquiring generic skills (e.g. programming and database design), rather than individual pieces of software.

- Training in carrying out a research project: starting from researching the literature, planning the project, writing novel, or using existing, software to carry out the research, successfully addressing technical and theoretical challenges, analysing and critically evaluating the results and writing up the project in a scientific format

- Personal and transferable skills (e.g. IT, communication, analytical and problem-solving, interpersonal, organizational, presentation, time-management, etc.).

Notably, the programme is offered entirely online, with content offered asynchronously being supported by regular, practice-focused synchronous sessions.

15	**Entry Criteria**

Applications are invited from graduates with a relevant 1st or 2.1 honours degree. Relevant subjects include the physical, chemical or biological sciences, mathematics, computing, engineering or allied subjects. Applications from those with degrees in other subjects or with a 2.2 will be considered on merit.

Students who fail to meet these criteria but have extensive evidence of relevant work experience may be accepted onto the course in exceptional circumstances. Very occasionally, applicants may need to be interviewed and/or to take a computing aptitude test to ascertain if they are likely to be ready at that time to benefit from the course.

The MRes course is very challenging and so applicants normally are required to enrol on the MSc initially so that their skills and knowledge can be thoroughly assessed. Applicants who perform very well in the first two modules may request to switch to the MRes course. The final decision is made by a panel of academic staff who teach on the course. Very occasionally, direct entry to the MRes course may be possible (e.g. in the case of applicants that have obtained funding through very competitive schemes) or where there is strong prior evidence that the student has already acquired the necessary skills to succeed.

16	**Learning Outcomes**

To gain the qualification the learner will have demonstrated the following skills specified in the learning outcomes for approved modules in the programme and for the programme as a whole:

1. Critically understand and apply computer techniques to a variety of biological information.
2. Use the tools and techniques of computer science, biology, chemistry and statistics to obtain information from the vast wealth of biological information that can be accessed via the Internet.
3. Understand the language and terminology of bioinformatics.
4. Be aware of current advances and challenges in bioinformatics.
5. The development of key practical skills (e.g. IT, analytical and problem solving skills).
6. Graduates will have developed/improved key personal and transferable skills (e.g. written and verbal communication, interpersonal, organisational, and presentation skills).
7. Graduates will have demonstrated an ability to research, plan, carry out and write up a project describing a computational solution to a biology question.

17	**Learning, teaching and assessment methods**

Students will undertake and be assessed in 4x 15-credit half-modules (total 60 credits) offered on the MSc Bioinformatics course.

Teaching is conducted entirely online. This takes the form of: (i) asynchronous sessions involving multiple, short online videos interspersed with other activities (e.g. quizzes, programming exercises using Jupyter Notebooks) combined with (ii) bi-weekly online, synchronous practical sessions. As needed, students may request additional support/ supervision from lecturers via online meetings (e.g. via Microsoft Teams).

Assessment methods vary on different modules, but may include: quizzes; in-class, open-book examinations in programming; essays; oral presentations; problem-based learning (e.g. a group programming project for the Biocomputing II half-module).

There are two phases of assessment for the research project: a thesis and a viva.

18	**Programme Description**

All students take 4 x 15-credit modules, giving a total of 60 credits, and a 120-credit research project module. Selection of modules is made in consultation with the course Director. All of the modules are delivered online only.

Full-time students take 4 taught modules in a single year. They are required to select 2 computational/statistical modules from those listed in group A below, and 2 biological modules from those listed in group B below. Some flexibility may be allowed depending on the specific background of the student. Students are encouraged to complete 4 modules in the first term; alternatively, 3 in the first term and 1 in the second.

Group A
- Autumn term: BioComputing I [CRYS001H7], Statistics [CRYS003H7]
- Spring term: Data Science [CRYS004H7]

Group B
- Autumn term: The Molecular Basis of Life [CRYS002H7], Sequence Analysis and Genomics [CRYS008H7]
- Spring term: Structural Bioinformatics [CRYS005H7], Omics [CRYS007H7]

The remaining 120 credits are awarded for the Thesis MRes Bioinformatics module [CRYS017Q7]. This module comprises a literature survey (dissertation) and oral presentation that are assessed together at an intermediate stage of the course (usually around February), and a thesis and viva that are assessed together at the end of the course.

Part-time students may take an *evening route* or a *daytime route* through the course. The Thesis MRes Bioinformatics [CRYS017Q7] module spans two years for all part-time students. Part-time students are encouraged to complete three modules in the first year but there is considerable flexibility, given that only half of the 8 modules are available each year. The 15-credit modules available to part-time students differ between the two routes (evening and daytime) and alternate from one year to the next, as follows:

Even years (e.g. 2014/15, 2016/17): evening route year 1, daytime route year 2

Statistics [CRYS003H7]

The Molecular Basis of Life [CRYS002H7]

Structural Bioinformatics [CRYS005H7]

Omics [CRYS007H7]

Odd years (e.g. 2015/16, 2017/18): evening route year 1, daytime route year 2

BioComputing I [CRYS001H7]

Data Science [CRYS004H7]

Sequence Analysis and Genomics [CRYS008H7]

Part-time students submit their literature review and give their oral presentation at the end of their first academic year. They submit their thesis and have their viva examination at the end of their second year.

19	**Programme Structure**

Full-Time programme – 1 year

Year 1

Level	Module Code	Module Title	Credits	Status*
7	See above	Module from Group A	15	Compulsory
7	See above	Module from Group A	15	Compulsory
7	See above	Module from Group B	15	Compulsory
7	See above	Module from Group B	15	Compulsory
7	CRYS017Q7	Thesis MRes Bioinformatics	120	Core

Part-Time programme – 2 years (even years, evening route OR odd years, daytime route)

Year 1

Level	Module Code	Module Title	Credits	Status*
7	See above	Module from Group B	15	Compulsory
7	See above	Module from Group B	15	Compulsory
7	See above	Module from Group A	15	Compulsory
7		Thesis MRes Bioinformatics (This is a two-year core module, examined at the end of the second year)		

Year 2

Level	Module Code	Module Title	Credits	Status*
7	See above	Module from Group A	15	Compulsory
7	CRYS017Q7	Thesis MRes Bioinformatics	120	Core

Part-Time programme- 2 years (odd years, evening route OR even years, daytime route)					
Year 1					
Level	**Module Code**	**Module Title**	**Credits**	**Status***	
7	See above	Module from Group A	15	Compulsory	
7	See above	Module from Group A	15	Compulsory	
7	See above	Module from Group B	15	Compulsory	
7		Thesis MRes Bioinformatics (This is a two-year core module, examined at the end of the second year)			
Year 2					
Level	**Module Code**	**Module Title**	**Credits**	**Status**	
7	See above	Module from Group B	15	Compulsory	
7	CRYS017Q7	Thesis MRes Bioinformatics	120	Core	

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 Irilenia Nobeli
21	**Start Date** *(term/year)*	Prior to 2008/2009
22	**Date approved by TQEC**	Prior to 2008/2009
23	**Date approved by Academic Board**	Prior to 2008/2009
24	**Date(s) updated/amended**	**November 2021.** Programme moved online, with associated changes in the mode of module delivery, and assessment schemes.