Year of entry: 2022/23

Programme Specification

1	**Awarding body**	University of London						
2	**Teaching Institution**	**Birkbeck College**						
3	**Programme Title(s)**	**MRes Computer Science**						
4	**Programme Code(s)**	TMRCOSCI_C						
5	**UCAS code**	N/A						
6	**Home Department**	Computer Science and Information Systems						
7	**Exit Award(s)**	PG Cert						
8	**Duration of Study** (number of years)	One year full-time, two years part-time						
9	**Mode of Study**	FT	**X**	PT	**X**	DL		
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 programme has been designed to meet the needs of both students wishing to advance their knowledge of computing or information systems before embarking on a Research and Development career in IT, or on an MPhil/PhD degree, and students already working in the IT sector. The programme builds on students' advanced understanding of computing and information systems (as required by the entry criteria to the programme) by offering a supervised research project in one of the following areas of advanced study: 1) Algorithms, Verification and Software, 2) Experimental Data Science, 3) Knowledge Representation and Data Management, In addition, students follow three taught modules in the above areas, and a module on Research Methods. Students who complete the programme successfully will have gained an in-depth theoretical and practical knowledge in their chosen area of study, which they will be able to use in: • analysis of problems, • evaluation of technology options, • deployment of appropriate solutions, and • research into, and development of, new technologies. The above three areas of study have a strong correspondence with the research expertise of the Department of Computer Science and Information Systems, which has a unique research profile within the University of London. Students will have the opportunity to undertake their research within ongoing research projects in the Department.

15	**Entry Criteria**
	The normal entrance requirements are a good first degree or MSc in computing, with the syllabus covering a substantial amount of programming, preferably in an object-oriented language. It is also expected that students will usually have completed at least introductory courses on computer networks and databases. Joint-honours computing graduates may also be eligible for entry provided they have covered the necessary prerequisite material. Candidates who have less than the required academic qualifications may be considered for entry if they have significant professional experience in the IT industry.

16	**Learning Outcomes**
	1. Subject Specific An advanced level of the following: a) knowledge In algorithms, complexity, verification and software knowledge in areas such as i) algorithms and complexity (1) circuit complexity (2) machine learning algorithms based on neural networks (3) parameterised algorithms (4) probabilistic algorithms (5) performance guarantees for heuristic algorithms ii) verification (1) automated software termination and runtime bounds analysis (2) probabilistic model checking (3) satisfiability problems for various logics (4) term rewriting iii) software (1) programming languages (2) compilers (3) software engineering OR b) knowledge in Experimental Data Science in areas such as i) Web social human dynamics Applied machine learning for Big Data ii) Visual and geometric computing iii) Management, integration and mining of life sciences data iv) Mobile computing and the Internet of Things v) Applications in the digital economy, healthcare technologies and technology-enhanced learning OR c) Knowledge Representation and Data Management Research Group

i) data integration
ii) data management
iii) knowledge representation and reasoning
iv) logic
v) ontology-based data access
vi) query languages and query optimisation
vii) semantic web technologies

2. Intellectual

- critical analysis of problems in IT
- identification of appropriate technical solutions
- ability to evaluate technologies in context
- reading and evaluation of research publications
- identification of new research directions

3. Practical

use of modern database, data warehousing, data mining and world wide web technologies

OR

use of logic, deep networks: architectures and learning algorithms, genetic algorithms, swarm intelligence, evolutionary computing, clustering, data visualisation and computer vision techniques

OR

use of object-oriented information systems analysis and design techniques, modern software development techniques, scalable applications and parallel and concurrent processing software

4. Personal and Social

- self-learning
- planning of work and working to deadlines
- preparing and delivering seminars
- planning, implementation and reporting of a substantial research project

17	**Learning, teaching and assessment methods**
	The principal teaching methods include formal lectures, tutorials and practical lab sessions. There are also seminars and group exercises carried out in class in some of the modules. There is a large element of practical coursework which students complete in their own time. Some of these coursework assignments are carried out in groups. The research project provides an opportunity for students to research more deeply into an aspect of the curriculum that particularly interests them. This research is undertaken with the guidance and supervision of two members of staff. Broader research issues are presented in research seminars run by the School, while research methodologies are covered in the Research Methods module.

	The assessment methods ensure that the learning outcomes of the programme are addressed, while taking into account the needs and background of the student body as well as the resources available. There is an appropriate balance between research project, coursework and examinations, allowing examiners to discriminate between different levels of achievement. On-going formative feedback is provided to students by means of feedback on an interim project report and a suitable range of coursework assignments. The Research Project is judged on project report of about 20,000 words (maximum 30,000 words) plus related technical submissions, and the project presentation. The presentation contributes 10% to the project mark, and the report 90%. The project report must contain a. a critical survey of the research literature in the area of research undertaken by the student, plus b. an account of the student's own work during the project. This may consist of new theoretical research results, or an implementation and critical evaluation of an existing research approach, or a combination of these. The research project allows students to demonstrate self-direction and originality in pursuing an area of current research with a significant element of critical evaluation as well as the ability to apply and develop the knowledge gained. The report and project presentation ensure students can communicate their conclusions clearly in writing and verbally. The Research Methods module is assessed by an interim project report of maximum 10,000 words plus related technical submissions, and an interim project presentation. The presentation contributes 20% to the mark, and the report 80%. The interim project report must contain a. a critical survey of the research literature in the area of research so far undertaken by the student, plus b. a report of the student's own work so far during the project, plus c. a work plan for work still to be done. Each taught module is assessed by a 2-hour written exam. In addition, some modules have a coursework component, which, for some, must be passed in order to pass the module.

18	**Programme Description**
	Students undertake a supervised individual Research Project, taken over 12 months by full-time students and 24 months by part-time students. In addition, a compulsory Research Methods module is taken in the first year. Students select a further three taught modules from the following list, appropriate to their chosen research area: such selections are subject to approval by the Programme Director. Not all modules on the programme will necessarily be offered in each year.

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19	**Programme Structure**

Full Time programme

Year 1

Level	Module Code	Module Title	Credits	Status*
7	COIY055H7	Research Methods	15	Core
7	COIY031Q7	MRes Computer Science Research Project	120	Core
7		3 x 15 credit options	45	Optional
Indicative list of options				
7	COIY025H7	Advances in Data Management	15	Optional
7	BUCI077H7	Applied Machine Learning	15	Optional
7	BUCI042H7	Data Analytics Using R	15	Optional
7	BUCI029H7	Cloud Computing	15	Optional
7	COIY029H7	Component Based Software Development	15	Optional
7	BUCI057H7	Data Science Techniques and Applications	15	Optional
7	BUCI004H7	Information and Network Security	15	Optional
7	BUCI059H7	Interactive Systems	15	Optional
7	COIY063H7	Internet and Web Technologies	15	Optional
7	COIY065H7	Machine Learning	15	Optional
7	COIY047H7	Mobile Computing and the Internet of Things	15	Optional
7	COIY064H7	Natural Language Processing and Information Retrieval	15	Optional
7	BUCI031H7	Programming Paradigms and Languages	15	Optional
7	COIY053H7	Semantic Technologies	15	Optional

Part Time programme

Year 1

Level	Module Code	Module Title	Credits	Status*
7	COIY055H7	Research Methods	15	Core
7		3 x 15 credit options	45	Optional

Year 2

Level	Module Code	Module Title	Credits	Status*
7	COIY031Q7	MRes Computer Science Research Project	120	Core
Indicative list of options				
7	COIY025H7	Advances in Data Management	15	Optional
7	BUCI077H7	Applied Machine Learning	15	Optional
7	BUCI042H7	Data Analytics Using R	15	Optional
7	BUCI029H7	Cloud Computing	15	Optional
7	COIY029H7	Component Based Software Development	15	Optional
7	BUCI057H7	Data Science Techniques and Applications	15	Optional
7	BUCI004H7	Information and Network Security	15	Optional
7	BUCI059H7	Interactive Systems	15	Optional
7	COIY063H7	Internet and Web Technologies	15	Optional
7	COIY065H7	Machine Learning	15	Optional
7	COIY047H7	Mobile Computing and the Internet of Things	15	Optional

7	COIY064H7	Natural Language Processing and Information Retrieval	15	Optional
7	BUCI031H7	Programming Paradigms and Languages	15	Optional
7	COIY053H7	Semantic Technologies	15	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 Oded Lachish
21	**Start Date *(term/year)***	Autumn 2003
22	**Date approved by Education Committee**	Summer 2003
23	**Date approved by Academic Board**	Summer 2003
24	**Date(s) updated/amended**	February 2020