# PROGRAMME SPECIFICATION

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| Name, title and level of final qualification(s) | **MRes Advanced Computing** <br> (Level 7) |
| Name and title of any exit qualification(s) | PG Cert Advanced Computing |
| Awarding Body | University of London |
| Teaching Institution(s) | Birkbeck, University of London |
| Home School/other teaching departments | School of Computing and Mathematical Sciences |
| Location of delivery | Central London |
| Language of delivery and assessment | English |
| Mode of study, length of study and normal start month | Full-time (1 year) <br> Part-time (2 years) <br> October |
| Professional, statutory or regulatory body | Not applicable |
| QAA subject benchmark group(s) <br> Higher Education Credit Framework for England | Computing |
| Birkbeck Course Code | TMRADCMP_C |
| HECoS Code | 100366 |
| Start date of programme | Autumn 2003 |
| Date of programme approval | Summer 2003 |
| Date of last programme amendment approval | 10 January 2023 |
| Valid for academic year and cohorts | 2023/24 |
| Programme Director | Oded Lachish |
| Date of last revision to document | 10/01/2023 |

*Note: programme titled MRes Computing up to 2022/3.*

**Admissions requirements**

A second-class honours degree (2:2 or above) or MSc in computing or other relevant degree with a substantial amount of programming, preferably in an object-orientated language. You should also have completed introductory courses on computer networks and databases. Joint honours computing graduates may also be eligible, provided they have covered the prerequisite material at the appropriate level.

We welcome applicants without traditional entry qualifications as we base decisions on our own assessment of qualifications, knowledge and previous work experience. We may waive formal entry requirements based on judgement of academic potential.

**Course 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:

- Algorithms, Verification and Software,
- Experimental Data Science,
- Knowledge Representation and Data Management,
- Machine Learning,
- Large-scale resource 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 areas of study mentioned above 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.

**Course structure**

| Level | Module Code | Module Title | Credit | Comp Core/ Option | Likely teaching term(s) |
|---|---|---|---|---|---|
| **Full-time – 1 year** | | | | | |
| 7 | COIY031Q7 | MRes Research Project | 120 | Core | 1-3 |
| 7 | COIY055H7 | Research Methods | 15 | Core | 1-2 |
| 7 | | Optional module x3 | 45 | Option | 1-2 |
| **Part-time – 2 years** | | | | | |
| **Year 1** | | | | | |
| 7 | COIY055H7 | Research Methods | 15 | Core | 1-2 |
| 7 | | Optional module x3 | 45 | Option | 1-2 |
| **Year 2** | | | | | |
| 7 | COIY031Q7 | MRes Research Project | 120 | Core | 1-3 |
| **Indicative option modules** | | | | | |
| 7 | COIY025H7 | Advances in Data Management | 15 | Option | 2 |
| 7 | BUCI077H7 | Applied Machine Learning | 15 | Option | 1 |
| 7 | BUCI029H7 | Cloud Computing | 15 | Option | 1 |
| 7 | BUCI042H7 | Data Analytics using R | 15 | Option | 1 |
| 7 | BUCI057H7 | Data Science Techniques and Applications | 15 | Option | 2 |
| 7 | BUCI040H7 | Information and Network Security | 15 | Option | 1 |
| 7 | COIY063H7 | Internet and Web Technologies | 15 | Option | 2 |
| 7 | COIY065H7 | Neural Networks and Deep Learning | 15 | Option | 2 |

Core:        Module must be taken and passed by student
Compulsory:        Module must be taken but can be considered for compensated credit (see CAS regulations paragraph 24)
Option:        Student can choose to take this module

**How you will learn**

Your learning and teaching is organised to help you meet the learning outcomes (below) of the course. As a student, we expect you to be an active learner and to take responsibility for your learning, engaging with all of the material and sessions arranged for you.

Each course is divided into modules. You will find information on the virtual learning site (Moodle, see Academic Support below) about each of your modules, what to expect, the work you need to prepare, links to reading lists, information about how and when you will be assessed.

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 Department, while research methodologies are covered in the Research Methods module.

**How we will assess you**

The course will use a variety of assessment methods. Assessment is used to enhance your learning rather than simply to test it. For most of the modules associated with this course, your assessment will be through practical lab exercises, coursework and written examinations.

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 critical survey of the research literature in the area of research undertaken by the student, plus
- 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 critical survey of the research literature in the area of research so far undertaken by the student, plus
- a report of the student's own work so far during the project, plus
- a work plan for work still to be done.

**Learning outcomes (what you can expect to achieve)**

'Learning outcomes' indicate what you should be able to know or do at the end of your course. Providing them helps you to understand what your teachers will expect and also the learning requirements upon which you will be assessed.

At the end of this course, you should have the ability to:

Subject Specific:

Demonstrate advanced knowledge in one of the following:

- algorithms, complexity, verification or software systems
- experimental data science

- knowledge representation or data management
- machine learning
- large-scale resource management

Intellectual:

- perform critical analysis of problems in computer science
- identify appropriate technical solutions
- evaluate technologies in context
- read and evaluate research publications
- identify new research directions

Practical:

Use one of the following:

- current algorithmic techniques
- modern verification tools
- novel software systems
- state-of-the-art data science technologies
- innovative knowledge representation and reasoning techniques
- modern data management approaches

Personal and Social:

The ability to:

- self-learn
- plan work and work to deadlines
- prepare and deliver seminars
- plan, implement and report on a substantial research project

**Careers and further study**

You will find MRes Advanced Computing graduates in the following kinds of roles:

Software developer, systems analyst, programmer, database administrator, data scientist, data analyst, IT architect, PhD student

Birkbeck offers a range of careers support to its students. You can find out more on the careers pages of our website.

**Academic regulations and course management**

Birkbeck's academic regulations are contained in its Common Award Scheme Regulations and Policies published by year of application on the Birkbeck website.

You will have access to a course handbook on Moodle and this will outline how your course is managed, including who to contact if you have any questions about your module or course.

**Support for your study**

Your learning at Birkbeck is supported by your teaching team and other resources and people in the College there to help you with your study. Birkbeck uses a virtual learning environment

called Moodle and each course has a dedicated Moodle page and there are further Moodle sites for each of your modules. This will include your course handbook.

Birkbeck will introduce you to the Library and IT support, how to access materials online, including using Moodle, and provide you with an orientation which includes an online Moodle module to guide you through all of the support available. You will also be allocated a personal tutor and provided with information about learning support offered within your School and by the College.

[Please check our website for more information about student support services.](#) This covers the whole of your time as a student with us including learning support and support for your wellbeing.

**Quality and standards at Birkbeck**

Birkbeck's courses are subject to our quality assurance procedures. This means that new courses must follow our design principles and meet the requirements of our academic regulations. Each new course or module is subject to a course approval process where the proposal is scrutinised by subject specialists, quality professionals and external representatives to ensure that it will offer an excellent student experience and meet the expectation of regulatory and other professional bodies.

You will be invited to participate in an online survey for each module you take. We take these surveys seriously and they are considered by the course team to develop both modules and the overall courses. Please take the time to complete any surveys you are sent as a student.

We conduct an annual process of reviewing our portfolio of courses which analyses student achievement, equality data and includes an action plan for each department to identify ongoing enhancements to our education, including changes made as a result of student feedback.

Our periodic review process is a regular check (usually every four years) on the courses by department with a specialist team including students.

Each course will have an external examiner associated with it who produces an annual report and any recommendations. Students can read the most recent external examiner reports on the course Moodle pages. Our courses are all subject to Birkbeck Baseline Standards for our Moodle module information. This supports the accessibility of our education including expectations of what information is provided online for students.

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The information in this programme specification has been approved by the College's Academic Board and every effort has been made to ensure the accuracy of the information it contains.

Programme specifications are reviewed periodically. If any changes are made to courses, including core and/or compulsory modules, the relevant department is required to provide a revised programme specification. Students will be notified of any changes via Moodle.

Further information about specifications and an archive of programme specifications for the College's courses is [available online](#).