# PROGRAMME SPECIFICATION

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|---|---|
| Name, title and level of final qualification(s) | **BSc Mathematics and Computer Science** (Level 6) |
| Name and title of any interim exit qualification(s) | Certificate of Higher Education Diploma of Higher Education |
| Is this programme offered with a Foundation Year | *Yes* |
| Awarding Body | University of London |
| Teaching Institution(s) | Birkbeck, University of London |
| Home Department/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 - 3 years, Full-time with FY - 4 years, Part-time - 4 years, September |
| Professional, statutory or regulatory body | Not applicable |
| QAA subject benchmark group(s) Higher Education Credit Framework for England | Mathematics, Statistics and Operational Research Computing |
| UCAS code | I107; I108 (with Foundation Year) |
| Birkbeck Course Code | UUBSMTCS_C – full-time, 3 years UBSMATCS_C – part-time, 4 years UUBFMTCS_C – full-time with FY, 4 years |
| HECoS Code | 100403 (mathematics) 100366 (computer science) |
| Start date of programme | Autumn 2025 |
| Date of programme approval | Spring 2025 |
| Date of last programme amendment approval | N/A |
| Valid for academic entry year | **2025-26** |
| Date of last revision to document | 21/11/2024 |

**Admissions requirements**

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.

UCAS tariff: 112 (48 for Foundation Year entry), with A Level Mathematics (TBC)

The UCAS tariff score is applicable to you if you have recently studied a qualification that has a UCAS tariff equivalence. UCAS provides a [tariff calculator](#) for you to work out what your qualification is worth within the UCAS tariff.

**Course aims**

The BSc Mathematics and Computer Science programme combines rigorous mathematical theory with comprehensive software development and modern computing practices, preparing students for the world of software development and computational problem-solving.

This programme aims to:

- provide a strong theoretical foundation through structured progression of mathematics modules, while simultaneously building practical programming and software development skills
- foster problem-solving skills through a combination of mathematical reasoning techniques, statistical theory and applications, algorithm design and implementation, software engineering methods, and distributed systems architecture
- build software development capabilities including object-oriented design and implementation, web development with PHP, and cloud computing solutions
- develop student's ability to communicate complex mathematical and technical concepts effectively, preparing them for roles in both academic and industrial settings.

The programme is designed for students who have a strong interest in mathematical theory and its practical applications, seeking to develop expertise in rigorous mathematical thinking and modern software development techniques for careers in software engineering, systems architecture, or related technical fields.

*Foundation Year*:
The Foundation Year is designed to build students' confidence and capabilities in the study of mathematics and data science. The Foundation Year provides a sound framework and body of knowledge for understanding the ideas and methodology of mathematics and programming, together with general skills modules including approaches to study and teamwork.

The BSc Mathematics and Computer Science with Foundation Year provides a perfect route to study for those who:

- do not meet the entry requirements for direct entry to an undergraduate data science and computing degree
- do not feel they are quite ready for undergraduate level study
- are returning to study after a significant break and need extra help and support.

Upon successful completion of the foundation year, students automatically progress to the BSc part of the Degree. The Foundation Year programme is studied full time over four years.

**Course structure**

| Level | Module Code | Module Title | Credit | Comp Core/ Option | Likely teaching term(s) |
|---|---|---|---|---|---|
| **Full-time programme – 3 years or 4 years with Foundation Year** | | | | | |
| **Foundation Year** | | | | | |
| 3 | CASE002S3 | Fundamentals of Study | 30 | Core | 1 |
| 3 | BUCI075H3 | Teamwork | 15 | Core | 1 |
| 3 | SC10001S3 | Foundation Year Mathematics | 30 | Core | 2 |
| 3 | BUCI085H3 | Programming Logic | 15 | Core | 2 |
| 3 | SC10002H3 | Foundation Year Programming | 15 | Core | 3 |
| 3 | BUCI076H3 | Computing Foundation Year Project | 15 | Core | 3 |
| **Year 1** | | | | | |
| 4 | SC10017H4 | Core Mathematics | 15 | Compulsory | 1 |
| 4 | SC10003H4 | Professional Issues in Computing | 15 | Compulsory | 1 |
| 4 | BUCI006H4 | Problem Solving for Programming | 15 | Compulsory | 1 |
| 4 | BUCI007H4 | Introduction to Programming | 15 | Compulsory | 2 |
| 4 | SC10018H4 | Calculus | 15 | Compulsory | 2 |
| 4 | SC10019H4 | Algebra Fundamentals | 15 | Compulsory | 2 |
| 4 | SC10007H4 | Object Oriented Programming | 15 | Compulsory | 3 |
| 4 | SC10020H4 | Linear Algebra | 15 | Compulsory | 3 |
| **Year 2** | | | | | |
| 5 | SC10004H5 | Database Management (Level 5) | 15 | Compulsory | 1 |
| 5 | BUCI030H5 | Data Structures and Algorithms | 15 | Compulsory | 1 |
| 5 | SC10005H5 | Software and Programming I (Level 5) | 15 | Compulsory | 1 |
| 5 | BUEM131H5 | Statistical Inference | 15 | Compulsory | 2 |
| 5 | SC10015H5 | Multivariable Calculus | 15 | Compulsory | 2 |
| 5 | SC10021S5 | Mathematical Reasoning and Discrete Structures | 30 | Compulsory | 2-3 |
| 5 | BUCI088H5 | Software and Programming II | 15 | Compulsory | 3 |
| **Year 3** | | | | | |
| 6 | SC10022D6 OR SC10009D6 | BSc Mathematics Project OR BSc Computer Science Project | 60 | Compulsory | 1-3 |
| 6 | | Optional modules (*see note below): | 60 | Option | 1-3 |
| **Part-time – 4 years** | | | | | |
| **Year 1** | | | | | |
| 4 | BUCI006H4 | Problem Solving for Programming | 15 | Compulsory | 1 |
| 4 | SC10003H4 | Professional Issues in Computing | 15 | Compulsory | 1 |
| 4 | BUCI007H4 | Introduction to Programming | 15 | Compulsory | 2 |
| 4 | SC10019H4 | Algebra Fundamentals | 15 | Compulsory | 2 |
| 4 | SC10007H4 | Object Oriented Programming | 15 | Compulsory | 3 |
| 4 | SC10020H4 | Linear Algebra | 15 | Compulsory | 3 |

| Year 2 | | | | | |
|---|---|---|---|---|---|
| 4 | SC10017H4 | Core Mathematics | 15 | Compulsory | 1 |
| 5 | SC10005H5 | Software and Programming I (Level 5) | 15 | Compulsory | 1 |
| 4 | SC10018H4 | Calculus | 15 | Compulsory | 2 |
| 5 | SC10021S5 | Mathematical Reasoning and Discrete Structures | 30 | Compulsory | 2, 3 |
| 5 | BUCI088H5 | Software and Programming II | 15 | Compulsory | 3 |
| Year 3 | | | | | |
| 5 | SC10004H5 | Database Management (Level 5) | 15 | Compulsory | 1 |
| 5 | BUCI030H5 | Data Structures and Algorithms | 15 | Compulsory | 1 |
| 5 | BUEM131H5 | Statistical Inference | 15 | Compulsory | 2 |
| 5 | SC10015H5 | Multivariable Calculus | 15 | Compulsory | 2 |
| 6 | | Optional modules (*see note below): | 30 | Option | 1, 2, 3 |
| Year 4 | | | | | |
| 6 | SC10022D6<br><br>SC10009D6 | BSc Mathematics Project<br>OR<br>BSc Computer Science Project | 60 | Compulsory | 1, 2, 3 |
| 6 | | Optional modules (*see note below): | 30 | Option | 1, 2, 3 |
| Optional modules – Computer Science: | | | | | |
| 6 | BUCI034H6 | Artificial Intelligence and Machine Learning | 15 | Option | 1 |
| 6 | SC10010H6 | Server-Side Web Programming | 15 | Option | 2 |
| 6 | BUCI028H6 | Cloud Computing | 15 | Option | 1 |
| Optional modules – Mathematics: | | | | | |
| 6 | BUEM003S6 | Statistics: Theory & Practice | 30 | Option | 3 |
| 6 | BUEM125H6 | Real Analysis | 15 | Option | 2 |
| ***Note:** Students selecting BSc Computer Science Project must take at least 30 credits in Level 6 Mathematics options. Students selecting BSc Mathematics Project must take at least 30 credits in Level 6 Computer Science options. | | | | | |

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 programme. 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. The programme 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, and information about how and when you will be assessed.

Teaching on this course is a combination of lectures (in some cases pre-recorded), seminars and group and individual tutorial work and practical lab work. Instructional material will be made available online. Lectures are designed to engage you with the material and to describe new topics and techniques, illustrated with plenty of examples. They are a springboard for your own learning. Seminars, group and lab sessions are where you will be asked to contribute to

discussion of problems / exercises which you need to have attempted in advance, and work on new problems / exercises. Statistics and programming modules also include practical lab sessions.

Each student undertakes an individual project in mathematics or computer science (including background research) which is supervised by a member of staff. The project provides an opportunity for students to investigate in depth an aspect of mathematics or computer science that particularly interests them.

**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. We use a variety of assessment methods. For most of the modules associated with this course, your assessment will be through the following types of assessment.

Coursework assignments, quizzes, written examinations, project proposal and final report.

**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 be able to:

Foundation year specific:

- Write effectively in an academic context.
- Research and read effectively in an academic context.
- Demonstrate understanding of a range of core concepts in the area of mathematics, computing, and programming.
- Work effectively in teams.
- Work independently to complete a small-scale research project.

BSc Programme as a whole:

- Understand and use mathematical techniques and computational algorithms.
- Construct mathematical arguments to establish a range of mathematical results.
- Knowledge and understanding of the processes and limitations of mathematical approximation and computational mathematics.
- Implement programming concepts across multiple languages.
- Debug and optimize programs effectively.
- Understand and apply core database concepts.
- Design, implement, and analyse software solutions.
- Demonstrate knowledge of data science tools, techniques and applications.
- Demonstrate an understanding of the importance of assumptions and the possible consequences of their violation.
- Present, analyse and interpret data.
- Demonstrate a deeper knowledge of some particular areas of mathematics or computer science.
- Use modern programming languages and development environments effectively.

- Comprehend conceptual and abstract material.
- Develop a logical and systematic approach to problem solving.
- Transfer knowledge and expertise from one context to another.
- Learn independently with patience and persistence using a variety of media.
- Communicate effectively using appropriate interpersonal skills.
- Complete a sustained and substantial task in a limited time period.

## Careers and further study

You will find mathematics and computer science graduates in the following kinds of roles:

- Software engineer
- Systems architect
- Technology consultant
- Software developer
- Algorithm developer
- Technical analyst
- Systems analyst
- Teacher
- Research & development engineer
- Technology professional

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.

BSc Mathematics and Computer Science 2025-26