PROGRAMME SPECIFICATION

Name, title and level of final qualification(s)	**MSc/MA Cognition and Computation** (Level 7)
Name and title of any exit qualification(s)	PG Dip, PG Cert Cognition and Computation
Awarding Body	University of London
Teaching Institution(s)	Birkbeck, University of London
Home school/other teaching departments	School of Psychological 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) Part-time (2 year) October
Professional, statutory or regulatory body	not applicable
QAA subject benchmark group(s) Higher Education Credit Framework for England	Psychology
UCAS code and URL	N/A
Birkbeck Course Code	TMSCOGCO_D, TMACOGCO_D
HECoS Code	(100956) programming (100989) cognitive modelling (100993) cognitive psychology
Start date of programme	October 2011
Date of programme approval	Summer 2011
Date of last programme amendment approval	April 2024
Valid for academic entry year	2023-24
Date of last revision to document	22/04/2024

Admissions requirements

Candidates are normally expected to have a second-class honours degree (2:2) or above in psychology, neuroscience, computer science, engineering, mathematics or a related discipline.

Applications are reviewed on their individual merits and your professional qualifications and/or relevant work experience will be taken into consideration positively. We actively support and encourage applications from mature learners.

Course aims

The aim of this programme is to offer a detailed introduction to the methods and findings from modern Cognitive Science, with an emphasis on computational approaches to understanding mind. The programme will enable students from a variety of backgrounds to appraise these findings and carry our independent research projects appropriately.

A range of distinct computational approaches will be covered, including symbolic modelling, connectionist modelling, production systems, cognitive architectures, and neural computation.

While the primary method is computational, experimental psychological methods will also be covered, and students will be given some exposure to the range of approaches now common in related areas, including biological, neuroimaging and genetic approaches. The programme is designed to be accessible for graduates with a background in both psychology and computation, and for both full-time students over 1 year and part-time students over 2 years.

Course structure

Level	Module Code	Module Title	Credit	Status	Teaching term(s)
Full-time – 1 year					
7	PSYC077H7	Advanced Quantitative Methods	15	Core MSc /Compulsory MA	Term 1
7	SCPS166H7	Introduction to Python Programming	15	Compulsory	Term 1
7	PSYC062H7	Generic Research Skills	15	Compulsory	Term 1
7	PSYC004H7	Cognitive, Affective and Social Neuroscience	15	Compulsory	Term 1
7	PSYC003H7	Sensorimotor Processes and Attention	15	Compulsory	Term 2
7	PSYC105H7	Fundamental Debates in Cognitive Science	15	Compulsory	Term 2
7	PSYC107H7	Computational Approaches to Mind	15	Compulsory	Term 2
7	PSYC111H7	Case Studies in Computational Modelling	15	Compulsory	Term 2
7	PSYC078H7	MSc Dissertation (MSc only)	60	Core	Terms 1,2,3
7	SCPS008D7	MA Dissertation (MA only)	60	Core	Terms 1,2,3

Part-time- 2 years					
Year 1					
7	PSYC077H7	Advanced Quantitative Methods	15	Core MSc /Compulsory MA	Term 1
7	SCPS166H7	Introduction to Python Programming	15	Compulsory	Term 1
7	PSYC003H7	Sensorimotor Processes and Attention	15	Compulsory	Term 2
7	PSYC105H7	Fundamental Debates in Cognitive Science	15	Compulsory	Term 2
Year 2					
7	SC12001H7	Academic Skills for PG Students	15	Compulsory	Term 1
7	PSYC004H7	Cognitive, Affective and Social Neuroscience	15	Compulsory	Term 2
7	PSYC107H7	Computational Approaches to Mind	15	Compulsory	Term 2
7	PSYC111H7	Case Studies in Computational Modelling	15	Compulsory	Term 2
7	PSYC078H7	MSc Dissertation (MSc only)	60	Core	Terms 1,2,3
7	SCPS008D7	MA Dissertation (MA only)	60	Core	Terms 1,2,3

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.

Your learning for this course will be organised around the activities outlined below.

The programme includes lecture-based theory modules, practical laboratory modules and either a supervised project (MSc) or a directed critical literature review (MA). The teaching styles are matched to the content, and class sizes are kept small or moderate (10–40) to encourage student participation, even in lecture-based modules.

One module (Generic Research Skills) involves small group collaborative learning. The module includes both lectures and sessions where the class is split into smaller groups and each group will under the direction of the instructor explore solutions to generic organisational issues such

as time management, IPR, organising large amounts of literature. It also involves presenting orally an outline of the student's possible research topic.

One module (Advanced Quantitative Methods) features lectures with laboratory/practical session. These provide students with hands-on experience of using statistical software in a relatively self-contained setting.

Six modules (Fundamental Debates in Cognitive Science, Computational Approaches to Mind, Case Studies in Computational Modelling, Introduction to MatLab Programming, Cognitive Affective and Social Neuroscience, and Sensorimotor Processes) feature lecturing as well as guided discussion led by one member of academic staff. Students are encouraged to also contribute to the discussion. This provides students with an opportunity to raise questions about specific issues or debates within the area and to understand the motivation for different computational methods when addressing different aspects of cognitive processing.

There are no options or streams – all students will follow the same curriculum. While it is envisaged that students will come into the programme with different strengths (e.g., computing versus psychology), experience has shown that all students benefit from the material in all modules.

All modules also involve self-directed learning in the form of self-paced reading and preparation for each of the sessions.

For MSc students, the dissertation – a supervised research project – is carried out under the supervision of a member of academic staff with expertise in computation and research interests in the area of the project. This provides students with access to a specialist in their project area who can provide expert advice on all aspects of the research. The project also ensures that taught skills are exercised within a constructive environment during the course.

For MA students, the dissertation (a directed critical literature review) similarly is supervised by a subject expert.

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 coursework, in the form of essays, programming scripts, a dissertation, and statistical worksheets. You will also be asked to make a presentation outlining your dissertation project. Assessment procedures will ensure that students develop a portfolio of work over the duration of the programme, and feedback on coursework required for some of the modules will encourage personal development.

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 show:

Subject Specific:

1. Knowledge of the different theoretical positions and debates underlying a range of areas within cognitive science
2. Practical knowledge of all phases of developing, conducting and reporting a computational research project
3. Understanding of conventions in psychological report writing and the purpose of each section within a research report
4. Understanding the similarities and differences between a range of computational approaches to psychological processes, including symbolic, connectionist, production system and cognitive architectures
5. Understanding how computational approaches may be applied in a range of domains within cognitive science, including action selection, memory, attention, cognitive development, higher-level cognition
6. Understanding the relation between computational approaches and research questions /methodologies
7. An understanding of programming for experimental and simulation purposes, or of the breadth of and key issues in contemporary cognitive psychology
8. Knowledge of a wide range of parametric and non-parametric univariate and multivariate statistical procedures, the conditions under which they may reasonably be applied, and how to interpret the results of the procedures
9. Understanding the ethical guidelines of the British Psychological Society and ramifications of ethical practice

Intellectual:

10. Understanding and being able to evaluate the logical flow of a scientific argument
11. Ability to articulate some similarities and differences between computational methods and to evaluate the arguments presented for and against different computational methodologies
12. A critical appreciation of contemporary cognitive research and research methodologies across a number of areas within the Cognitive Sciences
13. Understanding alternative ways of addressing a research question and how to advance reported research
14. Critical thinking skills in relation to: presenting and critiquing an argument; evaluating theoretical assumptions underlying contemporary Cognitive Science; and reviewing and assimilating existing topic-specific literature and formulating a research question
15. The ability to formulate and test hypotheses
16. An ability to study a problem in-depth
17. Logical thinking (e.g., in relation to hypothesis testing)
18. Evaluation skills

Practical:

19. Enhanced essay and report writing
20. Enhanced numeracy in relation to understanding numerical data
21. General IT skills, including use of web browsers for research, email, Word, PowerPoint, referencing software
22. Subject specific IT skills (familiarity with SPSS and MatLab)
23. Ability to conduct literature reviews using electronic search tools, electronic journals and databases (PsycInfo)
24. Ability to summarise and assess contemporary research succinctly
25. An ability to apply a range of computational methods to specific research questions
26. Data collection and analysis skills
27. Ability to present data in a meaningful way, and to transform it into different presentational formats

28. Planning and organizational skills

Personal and Social:

29. Ability to work with others in small groups on practical research tasks
30. Ability to work independently
31. To effectively plan and organize substantive, medium-term, projects
32. Time management skills
33. To communicate effectively through both written reports and verbal presentations
34. An enhanced ability to appreciate (and formulate) a structured argument and to appreciate the theoretical assumptions underpinning such arguments
35. An understanding of the relevance of scientific research as reported in the media to everyday questions
36. An increased awareness of ethical issues and ethical practice

Careers and further study

Graduates can pursue career paths in psychology, research sciences, and other disciplines in which computer simulation is used. Possible professions include:

- psychologist
- scientific researcher
- visual scientist
- higher education lecturer.

Birkbeck's Cognition and Computing graduates will complete with a set of valuable attributes, for example:

- High-level written communication skills in English
- Research skills
- Skills in evaluating and assessing types of information
- Quantitative analysis skills
- Programming skills
- Planning and organisational skills
- Data collection and presentation skills

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.

Students have access to a Postgraduate Psychological Sciences Learning Support Officer and to learning resources developed by the Learning Support Officer team of the Department of Psychological Sciences.

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.

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.