

PROGRAMME SPECIFICATION

This document describes the **Masters of Science in Biological Sciences Research**. This specification is valid for new entrants from **September 2011**.

The aims of this degree programme are:

- to provide training in the key generic skills required to be a scientific researcher;
- to provide advanced training in a specialised branch of biological sciences research;
- to ensure familiarity with a range of transferable, advanced research skills;
- to provide practice in communicating results of research both by oral presentation and by preparation of a draft scientific paper.

The programme is delivered over one year (52 weeks) of full-time study or two years of part-time study (104 weeks). It provides in-depth research training and practice in the Biological Sciences. The degree was initiated in 2000 as part of the School of Biological Sciences' development of a 1+3 years research training programme (one year Master's leading to three years PhD). Students receive training in generic scientific and specialised discipline-specific research skills. Development of a single research project provides students with much greater depth and focus of knowledge and skills than is found in comparable Masters by Research, which usually involves three small projects. The programme eschews production of a lengthy, and therefore unpublishable, thesis: rather, students produce a draft scientific paper based on their supervised research work, the major output required in future bioscience careers.

This document provides a summary of the main features of the programme(s), and of the outcomes which a student might reasonably be expected to achieve if full advantage is taken of the learning opportunities provided. Further information is contained in the College prospectus, the College Regulations and in various handbooks issued to students upon arrival. Whilst Royal Holloway keeps all its information for prospective applicants and students under review, programmes and the availability of individual courses are necessarily subject to change at any time, and prospective applicants are therefore advised to seek confirmation of any factors which might affect their decision to follow a specific programme. In turn, Royal Holloway will inform applicants and students as soon as is practicable of any substantial changes which might affect their studies.

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Learning outcomes

The programme complies fully with Descriptors for a Masters level qualification set out by the Quality Assurance Agency for Higher Education in England and Wales (QAA) as all of its learning outcomes are at Masters (M) level. In general terms the programme provides opportunities for students to develop and demonstrate the following learning outcomes:

Knowledge and understanding

- in-depth and critical knowledge of a specialised field
- *knowledge and understanding of research methodologies relevant to long-term, advanced scientific research*
- knowledge and understanding of relevant information technology, and its application to the research project
- advanced understanding of the key features of a good scientific paper, their peer review and how to prepare a paper for publication
- advanced understanding of the key features of a high quality grant proposal
- understanding of safety and good practice in laboratory and field, and the ability to complete a risk assessment
- ability to use citations appropriately

Skills and other attributes

- advanced discipline-specific research skills in a branch of the biological sciences
- independently planning and executing a research project to time*
- oral communication, including presentations, public speaking and communication with the popular media*
- written communication, including the ability to author scientific posters and produce research papers with a logical structure and in comprehensible and unambiguous English*
- authoring of simple web pages*
- formulation of clear testable hypotheses and development of valid experimental designs*
- acquisition, analysis and interpretation of data *
- presentation of graphical data in a clear and appropriate format*
- information synthesis, for presentation or written report*
- time management*
- team-work*
- self-motivation, flexibility, adaptability*

* transferable skills

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Teaching, learning and assessment

Teaching and learning is mainly by tutorials, completion of coursework and private study for the taught modules; by preparation and participation in oral presentations, involving discussion and feedback from the supervisor and research group; and for the project by independent research and private study, supported by research supervision.

Students receive regular, scheduled, feedback on: their performance in taught modules; their project plan and draft introduction (autumn term); draft materials and methods write up (spring term); preparatory oral presentation (spring term); oral presentation (summer term); and draft project write up (summer term). Completion of tasks is monitored centrally to ensure students experiencing difficulty can be identified and provided with appropriate support.

Assessment is by coursework for the taught modules, an oral presentation and a research project written up in the form of a draft paper for a specified journal. Full details of the assessments for individual courses can be obtained from the [School](#).

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Details of the programme structure(s)

The programme comprises three elements, as follows:

- Element 1 (25%): Assessment of specified core taught modules (currently 10) (see below) which provide training in generic scientific research skills and discipline-specific, but transferable, advanced research skills.
- Element 2 (10%): Training in the delivery of a conference oral presentation; delivery and feedback on a preparatory presentation; development of a presentation with advice from a supervisor; followed by a 20 minute oral presentation in front of a friendly but critical audience of peers and members of the School of Biological Sciences.

- Element 3 (65%): Intensive individual training in a specialised branch of biology by a supervisor and research group during a detailed research project, leading to the production of a draft scientific paper reporting the results of the project formatted for an appropriate target journal.

The following training in research skills is provided, although choice of options may differ slightly from year to year. Choice of options is undertaken in conjunction with the project supervisor to ensure coherence to an individual student's programme. All Core modules must be taken and sufficient optional modules to total 24 modules taken in total.

For part time students attendance at taught sessions and assignment hand in dates will be spread across the two year period as agreed between the student, Supervisor and course coordinator. This will be arranged as much as possible to fit around the student's commitments.

Personal Research Skills

CORE: Safety and good practice in the laboratory and field
 Time management
 Demonstrating in the laboratory
 Introduction to teaching in higher education
 Designing a research project
 Effective teamwork
 Negotiating and selling skills
 Plagiarism
 Bioethics

Information technology in biosciences research

CORE: Literature retrieval and organising citations
 Introduction to Dreamweaver
 Further features of Dreamweaver
 Univariate statistical techniques
 Multivariate statistical techniques

OPTIONS: Introduction to bioinformatics

Data acquisition and analysis

CORE: Designing your experiments

OPTIONS: Biological imaging
 BLAST and associated data bases

Communicating results

CORE: Preparing and presenting a paper
 Giving a talk at a conference
 Communicating with the media
 Writing scientific papers
 Submitting papers for publication

Research funding and commercial exploitation

CORE: Writing grant proposals
 Funding from the UK research councils and charities
 Intellectual Property rights
 Biological Sciences in a commercial environment
 Quality assurance in biosciences research

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Progression and award requirements

To pass the programme a student must achieve an overall weighted average of at least 50%, with no mark in any element which counts towards the final assessment falling below 50%. The Sub-board of Examiners may, with the agreement of the External Examiner, condone a mark for the taught modules (Element 1) or the oral presentation (Element 2) of not less than 40%, when considering a student's

assessment. Students may retake a failed element once only.

The Masters degree with Merit may be awarded if a student achieves an overall weighted average of 60% or above, with no mark in any element which counts towards the final assessment falling below 50%.

The Masters degree with Distinction may be awarded if a student achieves an overall weighted average of 70% or above, with no mark in any element which counts towards the final assessment falling below 50%. A Distinction will not normally be awarded if a student re-sits or re-takes any element of the programme. In exceptional circumstances a viva may be held for a student at the request of the Examiners.

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Student support and guidance

- Personal Supervisor: All students are allocated a supervisor, with whom they meet regularly to discuss all matters relating to their course and for pastoral support.
- Personal Adviser: Students also have an advisor, who deputises for the supervisor in his/her absence, and who can provide additional support and guidance. Students are free to meet their advisors as and when necessary.
- Induction sessions and termly meetings with the Programme Director.
- Membership of a research group.
- Representation on the Postgraduate Committee.
- All staff available and accessible through an open-door policy or by operating an office hours system.
- Student handbook.
- Extensive supporting materials and learning resources in College libraries and computer centre.
- Dedicated School teaching laboratories and a computer suite housed in the School of Biological Sciences (Bourne) Building.
- A School of Biological Sciences Special Needs Officer.
- College Careers Service and School Careers and Career Service Liaison Officer, supplemented by a dedicated careers area housing PC support within the School.
- Access to all College and University support services, including Student Counselling Service, Health Centre and the Education Support Unit for students with special needs.

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Admission requirements

Possession of an appropriate honours degree (2:ii or higher) or an equivalent qualification from overseas is the normal entry requirement. Applications from candidates who hold other qualifications or who have relevant work experience will also be considered. Students whose first language is not English may also be asked for a qualification in English Language at an appropriate level. For further details please refer to the [Prospective Students](#) web page. It may also be helpful to contact the [Admissions Office](#) for specific guidance on the entrance requirements for particular programmes.

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Further learning and career opportunities

The programme prepares students for future careers in Biological Sciences research, including doctoral degrees, and related areas of employment. Students are provided with training in a range of subject specific and transferable skills.

Information on these opportunities is provided by talks on careers and higher degree opportunities, organised by the College Careers Service. An online careers information centre for all students in the School of Biological Sciences is based within the Bourne building. For more details on further learning and career opportunities please refer to the [Careers Service](#).

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Indicators of quality and standards

Royal Holloway's position as one of the UK's leading research-intensive institutions was confirmed by the results of the most recent Research Assessment Exercise (RAE 2008) conducted by the Higher Education Funding Council (HEFCE). The new scoring system for the RAE 2008 measures research quality in four categories, with the top score of 4* indicating quality that is world-leading and of the highest standards in terms of originality, significance and rigour. 60% of the College's research profile is rated as world-leading or internationally excellent outperforming the national average of 50%. The College is ranked 16th in the UK for research of 4* standard and 18th for 3* and 4* research. The School of Biological Sciences was ranked joint 3rd in the top 10 universities in the country in terms of proportion of 3* and 4* research, with 70% of its research profile being of 3* and 4* standard.

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List of postgraduate programmes

The programmes are taught entirely by staff at Royal Holloway, University of London and lead to an award of the University of London. Programmes in Biological Sciences are not subject to accreditation by a professional body. The Banner programme code is given in parentheses.

Masters of Science in Biological Sciences

MSc Biological Sciences Research (1024)

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