

# Programme Specification

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## Title of programme: Masters of Science in Neuroscience (1 year): 2019-20

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton <i>[or if joint award, also include name of other awarding body]</i>	
Teaching Institution	University of Southampton	
Mode of study	Full time	
Duration in years	1 year	
Accreditation details	Not Applicable	
Final award	Masters of science in Neuroscience	
Name of award	Neuroscience	
Interim Exit awards	Diploma of Higher Education, Certificate of Higher Education	
FHEQ level of final award	Level 7	
UCAS code	N/A	
QAA Subject Benchmark or other external reference	QAA: Master's degree characteristics (2010) Higher Education Qualifications (FHEQ)	QA/
Programme Lead	Dr. Amrit Mudher and Dr. James Dillon	
Date specification was written	November 2016	
Date Programme was validated	03 May 2017	
Date specification last updated	03 May 2017	

## Programme Overview

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### Brief outline of the programme

The programme builds on the existing Integrated Neuroscience Masters with its research-focused neuroscience content that allows progressive specialisation in the field. The Masters in Neuroscience post-graduate degree will offer a balanced programme where students will gain the relevant skills and knowledge required for a career in Neuroscience.

Newly created modules in advanced human neuroanatomy, neuronal and glial physiology in health and disease will form the key pillars of the taught component of this program. This will be complimented by compulsory research focused, interactive experimental workshops exposing students to the extensive Neuroscience expertise in Southampton. Workshops will focus on neuro-drug discovery, model organisms in neurological disease, dementia research including iPSC-models and neuropathological studies, neural networks, behavioural neurosciences, cell and molecular neurobiology and interdisciplinary neuroscience. Alongside students will undertake an individual extended research-based project, in one of fourteen research labs currently conducting cutting-edge neuroscience research. Research spans normal physiological function (such as circadian biology, aging processes and synaptic physiology) to neurodegenerative disease (such as dementia research, neuroinflammation, translational research). Additionally there will be a variety of optional modules on offer including a library-based dissertation, critiques on current research seminars, neuroimaging, critical thinking as well as other skills-based modules. Students will also have the option to study allied subjects such as Psychology and Ethics in the context of Neuroscience. Teaching will be conducted in both traditional lecture-style groups as well as smaller interactive workshop based groups and practicals, led by both UoS research active neuroscientists, as well as external invited experts in the field. Throughout the programme, students will undertake independent reading both to supplement and consolidate the taught material and to broaden their knowledge and understanding of neuroscience. Through assessments, students will be taught to critically assess research papers, synthesize evidence based written scientific arguments and disseminate data through poster and oral presentations.

## Special Features of the programme

This programme involves optional attendance to one UK-based Neuroscience meeting. The meeting registration will be organised by the course coordinator but students will be required to make independent arrangements for travel and accommodation if required. Meetings will typically be one of “The British Neuropathological Society annual meeting”, the “British Neuroscience Association Christmas meeting” and “The Biochemical Society’s focused Neuroscience meetings”.

## Learning and teaching

Eight taught modular units are taken, four in semester one and four in semester two. Of these, 5 are compulsory modules and 3 are optional modules that can be chosen from a pool of 10 neuroscience modules. Some of the modules comprise of lectured units normally consists of two lectures a week plus a practical component (the nature of which differs depending on the module). Some of the compulsory modules, have extended workshop formats supplemented by hands-on experimental elements involving interactions between small groups of students and academics. Additionally, some modules take the format of research seminars, dominated by the research project and guided study. The contribution of practicals and other components of in-course assessment to the final mark will vary from module to module. In semester 3, a lab-based research project, equivalent to 4 modules will be undertaken. This culminates in a manuscript-style written dissertation and oral/poster presentation at the annual Southampton Neuroscience Group conference at the end of the academic year.

## Assessment

Examinations are held in the two weeks after each semester, in January and June. An equal weighting of 1:1:1 for the grades obtained in each of the three semesters will be used to calculate the exit grade for the Masters Neuroscience programme. Marks for semester 1 and 2 will be those obtained in 120CP units and those obtained in semester 3 will be the project equivalent to 60CP units.

Programmes and major changes to programmes are approved through the University’s programme [validation process](#) which is described in the University’s Quality handbook.

## Educational Aims of the Programme

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Neuroscience is the study of all aspects of the nervous system, from the molecular to behavioural level, and is addressed in the context of the physiology and pathology of the whole organism. Graduates in Neuroscience are needed to help address key challenges for society such as neurological and psychological conditions, as well as to improve fundamental understanding of brain function. Graduates are also well qualified to go on to a variety of areas of employment. In Southampton you will undertake a balanced programme where you will gain the relevant skills and knowledge required for a career in this subject area.

The aims of the programme are to provide you with:

1. a stimulating, informed environment through a wide range of interesting and contemporary courses with flexibility and choice, but allowing you to focus increasingly as you progress through each part of your degree;
2. a sound scientific knowledge base in Neuroscience;
3. the ability to describe and comment on specific aspects of current research in Neuroscience;
4. an appreciation of the limits of our current understanding of Neuroscience and how these may be advanced by further relevant research;
5. an opportunity to develop a range of transferable skills (information and communication technology, team working, written and oral communication, time management, planning, data collection and presentation);
6. opportunities to develop your skills of critical thinking and to show that you can pursue independent study;
7. an opportunity to undertake independent projects on a Neuroscience topic, including an in depth

- research project in an academic research laboratory;
8. an education and training suitable for a wide variety of careers and that will prepare you for higher degrees and careers in Neuroscience research;
  9. the capability of life-long learning, study and enquiry.

## **Programme Learning Outcomes**

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### **Knowledge and Understanding**

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Having successfully completed this programme you will be able to demonstrate critical awareness of current issues in Neuroscience in the context of the biomedical sciences. Specifically you should be able to:

1. demonstrate a comprehensive knowledge and systematic understanding of the principles of neuroanatomy and neurophysiology and its interactions with other systems in the body
2. appreciate how dysfunction and degeneration in the structure and function of the nervous system underpins neurological and neurodegenerative disease
3. demonstrate a knowledge of neuronal and glial function in physiological and pathological states
4. demonstrate knowledge of cutting edge experimental techniques and their use in Neuroscience research
5. critically analyse and evaluate published scientific articles and appreciate their contribution to current understanding in general and specific neuroscience research areas
6. synthesize and formulate scientific arguments and present them in recognized written scientific formats.
7. present scientific arguments and/or data orally in a logical and succinct manner to both scientific and lay audiences
8. a detailed knowledge and critical understanding of a key research area with Neuroscience gained through independent study
9. carry out, with supervision, an independent original scientific project in an area of Neuroscience research.
10. evaluate and present scientific data obtained demonstrating proficiency in use of statistical tests
11. become proficient in carrying out searches in literature databases and be able to use appropriate referencing software
12. appreciate the importance of scientific method, enquiry and ethical responsibility when conducting scientific research
13. demonstrate an ability to conduct self-directed and self-motivated independent study

### **Teaching and Learning Methods**

You will be taught through a combination of lectures, workshops, practical classes, coursework and projects. In Part 3 you will undertake an individual extended research-based project. In addition, you will study one lectured module in depth, allowing you to critically assess research papers and write an overview of one aspect of the field. A key component will be a new "Advanced Neuroscience" module in which you will be guided through the underpinnings of neuroscience research projects currently being undertaken. Throughout the programme you will undertake independent reading both to supplement and consolidate the taught material and to broaden your knowledge and understanding of Neuroscience.

## Assessment methods

You are assessed by a combination of continuous assessment and written examinations at the end of each semester to test your knowledge and understanding of the lecture and tutorial material. Continuous assessment is based on performance in tutorials, practicals and projects including dissertations and presentations

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### Subject Specific Intellectual and Research Skills

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Having successfully completed this programme you will be able to:

1. formulate and test hypotheses by planning, conducting and reporting a significant programme of neuroscience research
2. use a range of neuroscience laboratory equipment to conduct experiments
3. use computer software to record and analyse neuroscience data and determine their importance and validity
4. analyse critically and solve complex neuroscience problems
5. integrate your neuroscience knowledge base with other selected disciplines such as physiology, biology, pharmacology or biochemistry
6. independently integrate and critically evaluate neuroscience data from a wide range of sources, including primary source material in neuroscience journals and experimentation
7. demonstrate a systematic understanding of how the boundaries of neuroscience knowledge are advanced through research
8. conduct risk assessments concerning the use of chemicals, animal material and laboratory procedures
9. demonstrate broad expertise in defined areas of neuroscience at the level of current research in the field
10. critically evaluate the data and methodology of current published research in neuroscience and present your conclusions.

## Teaching and Learning Methods

In addition to the methods described in the section above you will be supervised in practical classes and hands-on experimental workshops. As part of your final year programme you will be guided in critically reviewing topics using primary source literature.

## Assessment methods

Your subject specific skills will be assessed as described in the section above. Experimental and research skills are assessed through an appropriate combination of laboratory reports, project reports and presentations.

### Transferable and Generic Skills

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The transferable skills you will develop during your degree are those that will improve your employability and will be of use to you in your future career. Having successfully completed this programme you will be able to:

1. communicate/present effectively both verbally and in writing on a range of Neuroscience topics to both specialised and non-specialised audiences

2. work with, and within, a group towards defined outcomes
3. use information technology and other resources to find, extract and synthesise information
4. solve problems relating to qualitative and quantitative information
5. learn independently through critical enquiry
6. demonstrate you have the ability to undertake appropriate further training
7. manage resources and time
8. demonstrate competency in using laboratory skills in a safe and responsible manner.

### Teaching and Learning Methods

You will be helped to acquire these skills through aspects of the formal teaching programme. In the early years this will mainly be through tutorial and coursework, whilst in parts 3 and 4 your project work will give you ample opportunity to further develop and practise many of the individual skills.

### Assessment methods

Your skills will be assessed as described in the section above, primarily through continuous assessment and through the hands-on advanced neurosciences experimental workpackage based module and your in-depth research project.

### Graduate Attributes (*optional*) (*not required for PG programmes*)

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Graduate Attributes are the personal qualities, skills and understanding you can develop during your studies. They include but extend beyond your knowledge of an academic discipline and its technical proficiencies. Graduate Attributes are important because they equip you for the challenge of contributing to your chosen profession and may enable you to take a leading role in shaping the society in which you live.

We offer you the opportunity to develop these attributes through your successful engagement with the learning and teaching of your programme and your active participation in University life. The skills, knowledge and personal qualities that underpin the Graduate Attributes are supported by your discipline. As such, each attribute is enriched, made distinct and expressed through the variety of learning experiences you will experience. Your development of Graduate

Attributes presumes basic competencies on entry to the University.

### Programme Structure

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#### Typical course content

There are five *compulsory modules*, which lay a solid foundation in the basic discipline of this programme. A compulsory module is one that you must take (but need not pass) pass to progress to the next level of study. The only exception to this is the first module (Structure and Function of the Nervous System) which will need to be passed to progress.

In the final semester the students are exposed to the forefronts of the discipline's knowledge, with the opportunity to conduct supervised original research.

This programme is intended to develop research skills in a more focused Neuroscience context than is possible in a broader undergraduate degree structure. You will also be exposed to cutting edge research, participating in seminar presentations in wide-ranging and specialist topics.

More detailed information of the subject combinations and the modules taken in each year can be found in Appendix 2.

## Special Features of the programme

The Masters in Neuroscience provides a flexible programme with which to pursue your interest in Neuroscience to the frontiers of our knowledge in this discipline. Modules undertaken in semester 1 and 2 provide you with a solid foundation in Neuroscience and important related disciplines needed to put the specific information in context. You will also develop a solid foundation and understanding of cutting edge Neuroscience experimental expertise. Throughout the programme you will have the opportunity to develop your own interests in particular fields of neuroscience research supported by a range of neurosciences courses. These courses are taught by researchers at the forefront of their disciplines from within the Centre and from the wider university, including the faculty of Medicine and Institute of Life Sciences. There is also the opportunity to conduct an original research project. The analytical skills acquired will be further honed in semester 3 where you have the opportunity to undertake an extended research projects in the Centres own research laboratories and attend modules which are research led, drawing extensively on research seminars given throughout the University. The analytical and practical skills acquired during this programme provide a strong foundation for a broad range of careers.

## Programme details

Details of the Programme Structure may be found on the Academic Unit web site <http://www.southampton.ac.uk/biosci/undergraduate/courses/master-of-neuroscience.page>? (Where an indicative list of options can be found. We cannot guarantee to offer every option each year); in the Year Handbooks, <http://www.southampton.ac.uk/student-services/academic-life/faculty-handbooks.page> and are briefly summarised below.

The Masters of Science in Neuroscience programme is offered as a full-time course and normally lasts for one year.

Study is divided into three semesters with semester 1 and 2 having 12 weeks for teaching and learning and 2-3 weeks for examinations. Semester 3 will be dedicated to the carrying of an independent research project and writing up the resultant dissertation.

The programme is divided into individual study modules. Each study module is accredited as being worth a certain number of credit points to you on successful completion. Modules are normally worth 7.5 ECTS which is equivalent to 150 hours of study. Modules are generally assessed at the end of each semester, but some are assessed entirely by coursework throughout the duration of the module.

The following modules (total 67.5 ECTS, 135 CATS) are *compulsory* (i.e. a minimum pass mark of 25%\* with the exception of the Structure and Function of Nervous System where pass mark is 60%) and must be taken:

Structure and Function of the Nervous system BIOL6079	7.5 ECTS
Synoptic Function in Health and Disease BIOL6080	7.5 ECTS
Glial Development and Biology BIOL679	7.5 ECTS
Advanced Neurosciences BIOL6087	15 ECTS
In-depth laboratory project BIOL6013	30 ECT

Three further optional modules can be taken from this list:

Neuropharmacology of CNS disorders BIOL6036	7.5 ECTS
Cell and Molecular Neurosciences BIOL6035	7.5 ECTS
Neurodegenerative disease BIOL6045	7.5 ECTS
Cellular signaling in health and disease BIOL6023	7.5 ECTS
Molecular Pharmacology BIOL6022	7.5 ECTS

Skills in Biomolecular NMR BIOL6077	7.5 ECTS
Bioethics Project BIOL6081	7.5 ECTS
Psychology module	7.5 ECTS
Current Research BIOL6053	7.5 ECTS

## Additional Costs

Students are responsible for meeting the costs associated travel and accommodation when attending Neuroscience meetings as part of the some of the optional modules.

## Progression Requirements

The programme follows the University's regulations for a standalone masters programme <http://www.calendar.soton.ac.uk/sectionIV/progression-regs-standalonemasters.html> as set out in the University Calendar.

*[This text may be amended only in cases where AQSC approval of exemption from University harmonised regulations has been granted. Where the programme has approved exemptions, the link to the relevant programme regulations in the Calendar should also be provided].*

## Intermediate exit points (where available)

### For PGT programmes:

You will be eligible for an interim exit award if you complete part of the programme but not all of it, as follows:

Qualification	Minimum overall credit in ECTS	Minimum ECTS required at level of award
Postgraduate Diploma	at least 60	45
Postgraduate Certificate	at least 30	20

## Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia)

- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career Destinations, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls (18.00-08.00)
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

**Associated with your programme you will be able to access:**

- An induction programme at the start of the course, which will provide orientation, information on modules, courses, library and computer facilities.
- Handbooks, module handbooks and material on the web.
- Library and academic skill packages.
- Well-equipped laboratories.
- Academic and pastoral support from members of staff, including your personal tutor which will include scheduled meetings at appropriate occasions during the academic year.
- Access to all administrative and academic material on the CBS, Programme and individual module web sites and/or Blackboard (<http://www.blackboard.soton.ac.uk>).
- Access to all academic staff through an appointment system and e-mail.
- Access to administrative staff in the Faculty Student Offices during the normal working day.
- Feedback on assessment.

## Methods for evaluating the quality of teaching and learning

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You will have the opportunity to have your say on the quality of the programme in the following ways:

- Completing student evaluation questionnaires for each module of the programme
- Acting as a student representative on various committees, e.g. Staff: Student Liaison Committees, Faculty Programmes Committee OR providing comments to your student representative to feed back on your behalf.
- Serving as a student representative on Faculty Scrutiny Groups for programme validation
- Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group

The ways in which the quality of your programme is checked, both inside and outside the University, are:

- Regular module and programme reports which are monitored by the Faculty
- Programme validation, normally every five years.
- External examiners, who produce an annual report
- A national Research Excellence Framework (our research activity contributes directly to the quality of your learning experience)
- Higher Education Review by the Quality Assurance Agency for Higher Education

## Criteria for admission

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*Faculties, for the information below, please check the Admissions policy which can be found at [www.southampton.ac.uk/admissions-policy](http://www.southampton.ac.uk/admissions-policy)*

The University's Admissions Policy applies equally to all programmes of study. The following are the typical entry criteria to be used for selecting candidates for admission. The University's approved equivalencies for the requirements listed below will also be acceptable.

## Postgraduate programmes

Please include the typical Bachelor's and Master's requirements (deleting where not accepting), and any atypical qualifications which will be accepted (including professional qualifications)

Qualification	Grade/GPA	Subjects requirements	Specific requirements
Bachelor's degree	2:1	Science related subjects	
Master's degree	Merit	Science related subjects	

## Recognition of Prior Learning (RPL)

The University has a [Recognition of Prior Learning Policy](#)

## English Language Proficiency

Please identify which of the University's standard English language bands will apply to this programme. – insert boxes for person completing form to select A, B, C, or D

See [www.southampton.ac.uk/admissions-language](http://www.southampton.ac.uk/admissions-language).

Alternatively, if you want to propose an English language level not described by the bands set out above, please complete the table below using IELTS grades (the University's standard equivalencies will then be applied to equate the IELTS requirements with TOEFL, PTE etc).

Overall	Reading	Writing	Speaking	Listening
6.5	5.5	5.5	5.5	5.5

## Career Opportunities

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- Neuroscience research
- Pharmaceutical industry
- Postgraduate research training
- Scientific officer in medical laboratories
- Teaching
- Legal profession
- Business management

## External Examiner(s) for the programme

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**Name:** To be confirmed

**Institution:** To be confirmed

**Name:** To be confirmed

**Institution:** To be confirmed

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student

Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their personal tutor in the first instance.

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**Please note:** This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook (or other appropriate guide) or online at [https://www.southampton.ac.uk/biosci/postgraduate/taught\\_courses/msc-neurosciences.page](https://www.southampton.ac.uk/biosci/postgraduate/taught_courses/msc-neurosciences.page)

## Appendix 2:

### Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme typically also have to pay for: [insert relevant bullet points from the following list]:

- Books and Stationery Equipment (such as Lab equipment, Field Equipment, Art equipment, Recording Equipment, stethoscopes, fob watch, Excavation equipment, Approved Calculators)
- Materials (such as laboratory materials, textbooks, drawing paper, fabric, thread, computer disks, Sheet Music)
- Software Licenses
- Clothing (such as Protective Clothing, Lab Coats, specific shoes and trousers)
- Printing and Photocopying Costs (such as Printing coursework for submission, Printing and binding dissertations or theses, Academic Poster (A1) printing).
- Typing Costs
- Field Trips (including accommodation costs for the field trips)
- Work Experience and Placements (including accommodation costs near the placement, additional insurance costs)
- Travel Costs for placements, field trips and to and from the University and various campus locations (including travel insurance).
- Paying for immunisation and vaccination costs before being allowed to attend placements.
- Obtaining Disclosure and Barring Certificates or Clearance Subsistence Costs
- Paying for a Music accompanist
- Translation of birth certificates (for programmes abroad)
- Conference expenses
- Professional exams
- Parking costs (including on placements at hospitals)
- Replacing lost student ID cards
- Other activities (e.g. visiting specialist marine stations and other institutions)
- Costs of attending a graduation ceremony (e.g. hiring a gown for graduation).

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at [www.calendar.soton.ac.uk](http://www.calendar.soton.ac.uk).