

BSc Mathematics and Psychology
For students entering Part 1 in 2008/9

UCAS code: GC18

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Mathematics, Statistics and Operational Research, Psychology
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	04/Oct/2010
Programme Director:	Dr Karen Ayres
Programme Advisor:	Dr Titus Hilberdink Dr Elizabeth Gaffan
Board of Studies:	Maths/Met/Physics
Accreditation:	British Psychological Society Graduate Basis of Registration

Summary of programme aims

The programme aims to give a broadly based training in modern mathematics and modern psychology, and to produce scientists qualified to apply mathematical techniques to a wide range of psychological problems. It aims to introduce students to the wide range of approaches that constitute modern Psychology, and to concepts and evidence within the domains of the subject required for British Psychological Society accreditation. Students have the opportunity to apply their knowledge to chosen areas of interest, increasing their degree of choice and independence as they move through the programme. They are made aware of current research - its methods, applications and unresolved issues - and learn how to evaluate research and carry it out themselves, with staff research expertise providing stimulation, guidance and high-quality laboratory facilities. (For a full statement of the programme aims and learning outcomes see below.)

Transferable skills

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills in line with the University's Strategy for Learning and Teaching. In following this programme, students will have had the opportunity to develop such skills, in particular relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working and use of information technology and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

As part of this programme students are expected to have gained experience in, and show competence in, the following: uses of IT including information search and mathematics software; presentation and analysis of quantitative data; written reports on projects; oral presentation and written summary of research and other material; teamwork; time management; project management; career planning.

Programme content

The profile which follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection "selected" modules). Students must choose such additional modules as they wish, in consultation with their programme adviser(s), as required, to make 120 credits in each Part. The number of modules credit for and the level of each module are shown after its title.

Part 1 (three terms)

Compulsory modules

<i>Module</i>	<i>Title</i>	<i>Credits</i>	<i>Level</i>
MA11A	Introduction to Analysis	20	C
MA11B	Calculus and Applications	20	C
MA11C	Matrices, Vectors and Applications	20	C
PY1CA	Cognition and Applied Psychology	10	C
PY1DS	Developmental and Social Psychology	10	C
PY1IN	Introduction to Neuroscience	10	C
PY1PL	Perception and Learning	10	C
PY1PR1	Psychological Research 1	10	C

PY1PR2	Psychological Research 2	10	C
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Part 2 (three terms)

Compulsory modules

<i>Module</i>	<i>Title</i>	<i>Credits</i>	<i>Level</i>
MA24A	Analysis	20	I
MA24L	Differential Equations and Fourier Series	20	I
PY2RM1	Research Methods and Data Analysis 1	10	I
PY2RMJ	Research Methods 2 for Joint Honours	10	I
MA2GS	General Skills	10	I
MA2NA	Numerical Analysis	10	I
PY2DP	Developmental Psychology	10	I
PY2SP	Social Psychology	10	I

At least one of:

PY2N1	Neuroscience 1	10	I
PY2N2	Neuroscience 2	10	I

At least one of:

PY2C1	Cognition 1	10	I
PY2C3	Cognition 3	10	I

British Psychological Society Graduate Basis of Registration

Students must gain a lower second class honours degree, or higher, to qualify for BPS GBR Psychology Part 2 modules PY2RM1 + PY2RMJ + PY2DP + PY2SP + *either* PY2N1 *or* PY2N2 + *either* PY2C1 *or* PY2C3 are the minimum required for BPS accreditation. *See also Part 3 Project.*

Part 3 (three terms)

Compulsory modules

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
PY3Q	Project for Maths or Stats Joint Students	30	H
MA3CA	Complex Analysis	10	H
MA3CV	Calculus of Variations	10	H

Optional modules

(i) Modules to the value of 40 credits from:

MA3DY	Dynamics	10	H
MA3ASP	Applied Stochastic Processes	10	M
MA3SM	Modelling of Soft Matter	10	M
MA3DS	Dynamical Systems	10	H
MA3C7	Boundary-value Problems	10	H
MA3W7	Control Systems	10	H
MA3HM	History of Mathematics	10	H
MA3VC	Vector Calculus	10	H
MA3MB	Mathematical Biology	10	H
MA3AM1	Asymptotic Methods I	10	H
MA3NLE	Analysis of Numerical Techniques for Linear Equations and	10	H

	Eigenvalue Problems		
MA3NIO	Analysis of Numerical Techniques for Integration and Ordinary Differential Equations	10	H
MA3MDE	Mathematics for Digital Economy	10	H

Note that most modules have pre-requisites and co-requisites which students must undertake. Information regarding pre-requisites and co-requisites can be found in the appropriate module description. Students on four year programmes need to be especially aware of any pre- and co-requisites of Part 4 modules when selecting Part 3 options.

****British Psychological Society Graduate Basis of Registration.** To qualify for BPS accreditation, the Project must be passed with at least 40%.

Optional modules:

(i) Modules to the value of 30 credits chosen from a list of Psychology options such as the following:

PY3TDV	Three Dimensional Vision	10	H
PY3CTT	Cognitive & Behavioural Theory to Therapy	10	H
PY3GD	Genes and Development	10	H
PY3SAN	Social & Affective Neuroscience	10	H
PY3FP1	Forensic Psychology 1: Managing Offending Behaviour	10	H
PY3IGR	Improving Intergroup Relations	10	H
PY3ELD	Early Lexical Development	10	H
PY3DN	Developmental Neuroscience	10	H
PY3FP2	Forensic Psychology 2: Clinical Applications of Forensic Psychology	10	H
PY3OS	Occupational Stress	10	H
PY3CBD	Cognitive Behavioural Approaches to Psychological Disorders	10	H
PY3LPA	Lexical Processing and Aphasia	10	H
PY3IR	Issues in Rationality	10	H
PY3WMC	Working Memory and Cognition	10	H
PY3ASD	Autism Spectrum Disorders	10	H
PY3AP	Auditory Perception	10	H
PY3VPM	Visual Perception - more than meets the eye?	10	H
PY3ACP	Cognitive Perspectives of Adult Clinical Psychology	10	H
PY3SC	Social Cognition	10	H
PY3CTT	Cognitive & Behavioural Theory to Therapy	10	H
PY3TDV	Three Dimensional Vision	10	H
PY3SE	Science of Emotion	10	H
PY3SAN	Social & Affective Neuroscience	10	H
PY3VPM	Visual Perception - more than meets the eye?	10	H

Progression requirements

To gain a threshold performance at Part 1 and qualify for the CertHE a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 1, where all the credits are at level C or above, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 1 to Part 2, a student shall normally be required to achieve a threshold performance at Part 1 and obtain at least 40% in the Mathematics modules averaged together, with at least 30% in each of those modules; and at least 40% in the Psychology modules PY11A, PY11B, PY11C, PY12D, PY12E and PY12F averaged together, with at least 30% in 5 out of those 6 modules.

To gain a threshold performance at Part 2 and qualify for the DipHE a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 2, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 2 to Part 3, a student shall normally be required to achieve a threshold performance at Part 2.

Part 2 contributes one third of the final assessment and Part 3 the remaining two thirds.

To be eligible for Honours students must pass the Project module.

Summary of teaching and assessment

Teaching is organised in modules that typically involve both lectures and (in Mathematics) problems. Some include practical work, either in large or small groups (Parts 1 and 2) or individually (Part 3 project). Many modules are supported by tutorial groups or seminars. The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks. The pass mark in each module is 40%. Modules are assessed by a mixture of coursework and formal examination. There are some modules which are assessed wholly by coursework and others wholly by examination; the details are given in the module descriptions.

Admission requirements

Admission requirements

Entrants to this programme are normally required to have obtained:

Grade C or better in English in GCSE; and achieved

UCAS Tariff: A Level: AAB in three A levels, including grade B in A Level Mathematics; or

International Baccalaureat: 30 points including 6 in Higher Mathematics; or

Advanced GNVQ: Merit in one of the following subject areas: Engineering, Information Technology or Science, accompanied by A Level Mathematics Grade B or

Scottish Highers: Grade A in Mathematics and two Bs and a C in three other subjects.

Irish Leaving Certificate: Grade A in Mathematics and three Bs and a C in four other subjects

Two AS grades are accepted in place of one A-Level except in Mathematics.

Admissions Tutor: Dr Graham Williams

Support for students and their learning

University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers, and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses the Student Access to Independent Learning (S@il) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, School Senior Tutors, the Students' Union, the Medical Practice and the Student Services Directorate. The Student Services Directorate is housed in the Carrington Building and includes the Careers Advisory Service, the Disability Advisory Service, Accommodation Advisory Team, Student Financial Support, Counselling and Study Advisors. Student Services has a Helpdesk available for enquiries made in person or online (www.risisweb.reading.ac.uk), or by calling the central enquiry number on (0118) 378 5555. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions on everything from accommodation to finance. The Carrington Building is open between 8:30 and 17:30 Monday to Thursday (17:00 Friday and during vacation periods). Further information can be found in the Student website (www.reading.ac.uk/student).

There are Course Advisers to offer advice on the choice of modules within the programme. The development of problem-solving skills in Mathematics is assisted by extensive provision of model solutions to problems. In Psychology, each Part of the programme has a Year Tutor, whose role is to provide information to students in that year, monitor their progress (liaising with the Course Administrator) and advise those who fall behind in academic work. Staff with relevant expertise, e.g. in dyslexia, support the departmental Special Needs advisor. Staff's specialised laboratories are available for use in student research projects.

Career prospects

Graduates whose degree includes Mathematics may find openings with various companies and research institutes that use mathematics directly (though for many of these the natural route is through a postgraduate qualification). The financial sector, both in actuarial and accountancy work, absorbs many graduates in mathematical disciplines. Because the degree is accredited by the British Psychological Society, graduates are qualified to enter training as, for example, clinical or educational psychologists. Psychology graduates move into an extremely wide range of careers with some bias towards health and education, but extending to many other professional roles. Joint degree graduates may proceed to careers in either of their subject areas, and this programme provides particularly appropriate training for teachers of mathematics. Recent graduates who have

followed this programme have gone into jobs as actuarial trainee, trainee chartered accountant, teaching, business analyst and postgraduate study.

Opportunities for study abroad or for placements

Although there are no formal arrangements for the Mathematics and Psychology programme, informal arrangements may be possible.

Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Knowledge and Understanding

A. Knowledge and understanding of:

1. The fundamental concepts and techniques of calculus, linear algebra, analysis and numerical mathematics
2. The use of the basic techniques of mathematics in applicable areas of mathematics, such as differential equations and numerical analysis
3. Concepts, theories and evidence in at least five out of six core domains of Psychology: research methods, individual differences, biological, cognitive, developmental and social psychology
4. A broad variety of methods and approaches used in psychological research
5. Practical applications of psychological theory and research
6. Ethical issues in research and appropriate conduct by researchers
7. A selection of more specialist optional topics.

Teaching/learning methods and strategies

The knowledge required is delineated in lectures and seminars. 1 and 2 are supported in Part 1 by tutorials and practical classes, and throughout by problems which students are expected to work on individually. 4 is further supported by practical classes and exercises, microprojects and Part 3 projects. Students also learn about 6 from participating in research studies in which the principles are made explicit, and while planning the Part 3 project. Part 3 optional modules cover 7 and extend earlier work to a more advanced level.

Assessment

Most knowledge is assessed by unseen or open-book examinations, coursework essays and other exercises, and reports on empirical work. The Part 3 project assesses both 6 in the plan and final report, and 4 through the rationale for the choice of methods.

Skills and other attributes

B. Intellectual skills - *able to*:

1. Think logically
2. Analyse and solve problems
3. Organise tasks into a structured form
4. Transfer appropriate knowledge and methods from one area within a subject to another
5. Use evidence-based reasoning to argue or evaluate a claim
6. Apply multiple perspectives and levels of explanation to understand behaviour
7. Critically evaluate the design and conduct of psychological research
8. Write well-structured and well-argued essays.

Teaching/learning methods and strategies

1-3 are explicated in lectures, tutorials or feedback on exercises throughout the Mathematics teaching, and 5-7 in Psychology lectures and option seminars. 4 is not formally taught but is illustrated and encouraged particularly in Part 3 modules, and is intrinsic to high-level performance in all parts of the programme. Psychology essays at Parts 1 and 2 provide practice in 8 with formative feedback.

Assessment

1-3 are assessed indirectly in most parts of Mathematics, and 5-8 in Psychology examinations and coursework at all levels. 4 is emphasised in formative and summative assessment as an indicator of the most successful work in both subjects.

C. Practical skills - *able to*:

1. Understand and construct mathematical proofs
2. Formulate and solve mathematical problems
3. Choose and apply appropriate data-analytic

Teaching/learning methods and strategies

Mathematical proof is taught in Part 1 lectures and reinforced in practical classes. Problem solving is introduced in lectures in Part 1 and forms a large

techniques to psychological data

4. Search for information, using suitable sources, about a specific topic
5. Plan and carry out empirical studies with guidance or supervision
6. Write reports on empirical studies.

D. Transferable skills - able to:

1. Use IT to write, to present information visually, for mathematical analyses and computation, to manage and analyse data, to communicate and to find information
2. Communicate information concisely or at length in writing
3. Give oral presentations
4. Work with a group
5. Plan and implement a project
6. Solve practical problems
7. Manage time
8. Start planning a career.

part of subsequent Mathematics. Dedicated modules using lectures, practical classes and exercises cover 3, 4 and the principles underlying 5. Further learning of 5 and 6 takes place through practical classes, microprojects and the Part 3 project.

Assessment

1-3 are tested both formatively in coursework and summatively in examinations. 3 and 6 are assessed in reports on practical classes. Microproject reports, the Part 3 project plan and report assess all of 3 - 6.

Teaching/learning methods and strategies

The use of IT is embedded throughout the computational side of the mathematics course and in practical modules in Psychology. 2, 3 4 and 8 form part of one Part 2 mathematics module; 2 and 3 are reinforced in various psychology modules throughout the programme, and 4 in the psychology microprojects. Competence at 5 is progressively developed through psychology microprojects and the Part 3 research project. 6 is encouraged by staged deadlines and is essential for the timely and effective completion of the programme.

Assessment

1 is required widely for coursework in both subjects, 2 for most psychology coursework and examinations. The Part 2 module General Skills includes assessments of 3, 4 and 8. 4 also forms part of microproject assessment and 3 is also assessed within Part 3 psychology options. 5-7 are necessary for successful completion of microprojects and the Part 3 project.

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 he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.