BSc Mathematics & Psychology   UCAS code: GC18

Awarding Institution:	The University of Reading
Teaching Institution:	The University of Reading
Relevant QAA subject benchmarking group(s):	Mathematics, Statistics and Operational Research , Psychology
Faculty of Science	Programme length: 3 years
For students entering Part 1 in 2005	Date of specification: 31-Mar-06

Programme Director:
Programme Adviser: Dr J. A. Leach (Mathematics), Dr E. A. Gaffan (Psychology)
Board of Studies: Mathematics, Psychology and Statistics.
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

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working and use of information technology.

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 (the "selected" modules). Students must choose such additional modules as they wish, in consultation with their programme adviser, 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)   *Credits*   *Level*
Compulsory modules

MA11A	*Introduction to Analysis*	20	C
MA11B	*Calculus and Applications*	20	C
MA11C	*Matrices, Vectors & Applications*	20	C
PY11A	*Psychological Research 1*	10	C
PY11B	*Perception & Learning*	10	C
PY11C	*Introduction to Neuroscience*	10	C
PY12D	*Psychological Research 2*	10	C
PY12E	*Cognition & Applied Psychology*	10	C
PY12F	*Developmental & Social Psychology*	10	C

Part 2 (three terms)   *Credits*   *Level*
Compulsory modules

MA24A	*Analysis*	20	I
MA24B	*Differential Equations*	20	I
MA24H	*General Skills and Numerical Analysis*	20	I
PY24A	*Research Methods & Data Analysis 1*	10	I
PY24B	*Developmental & Social Psychology 1*	10	I

At least one of:

PY24C	*Neuroscience 1*	10	I
PY25I	*Neuroscience 2*	10	I

At least one of:

PY24D	*Cognition 1*	10	I
PY25J	*Cognition 3*	10	I

Optional modules:

(i) *Modules chosen from the following, if necessary, to make an overall total of 60 credits in Psychology:*

PY25G	*Research Methods & Data Analysis 2*	10	I
PY24F	*Applied Psychology*	10	I
PY24E	*Cognition 2*	10	I
PY25H	*Developmental & Social Psychology 2*	10	I
PY25L	*Clinical Psychology*	10	I

British Psychological Society Graduate Basis of Registration. Psychology Part 2 modules PY24A + PY24B + *either* PY24C *or* PY25I + *either* PY24D *or* PY25J are the minimum required for BPS accreditation. *See also Part 3 Project*.

Part 3 (three terms)   *Credits*   *Level*
Compulsory modules

MA37A	*Complex Analysis and Calculus of Variations*	20	H
PY3Q**	*Project for Maths or Stats Joint students*	30	H

**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:*

PY3LD	*Language Development*	10	H
PY3DN	*Developmental Neuroscience*	10	H
PY3FP2	*Forensic Psychology 2: Clinical Applications of Forensic Psychology*	10	H
PY3ADD	*Acquired and Developmental Dyslexia*	10	H
PY3CNV	*Cognitive Neuroscience of Vision*	10	H
PY3OS	*Occupational Stress*	10	H
PY3VSD	*Visual & Spatial Development*	10	H
PY3CPA	*Clinical Psychology of Adulthood*	10	H
PY3LPA	*Language Processing & Aphasia*	10	H
PY3IR	*Issues in Rationality*	10	H
PY3WMC	*Working Memory & Cognition*	10	H
PY3ASD	*Autistic Spectrum Disorders*	10	H
PY3NCP	*Nature & Aetiology of Childhood Psychopathology*	10	H
PY3EDP	*Early Experience & Developmental Psychopathology*	10	H
PY3CDC	*Co-ordination Disorders in Children*	10	H
PY3AP	*Auditory Perception*	10	H
PY3CLM	*Clinical Aspects of Learning and Memory*	10	H
PY3ACP	*Cognitive Perspectives of Adult Clinical Psychology*	10	H
PY3SC	*Social Cognition*	10	H
PY3AV	*Active Vision*	10	H
PY3RA	*Risk & Accidents*	10	H
PY3NFD	*Neuropsychology of Frontostriatal Disorders*	10	H
PY3NP	*Neuropsychiatry*	10	H
PY3HP	*Health Psychology*	10	H
PY3CA	*Cognitive Neuropsychology of Ageing*	10	H
PY3IC	*Implicit Cognition*	10	H
PY3PCD	*Psychopharmacology of Clinical Disorders*	10	H
PY3MSC	*Multiple Social Categorization*	10	H

(ii) *Modules to the value of 40 credits chosen from*:

MA34E	*Linear Algebra and Coding Theory*	20	H
MA37E	*Numerical Analysis and Dynamical Systems 1*	20	H
MA3C7	*Boundary Value Problems* †	10	H
MA3D7	*History of Mathematics and its Applications‡*	10	H
MA3W7	*Control Systems* ‡	10	H
MA3X8	*Combinatorics* ‡	10	H
MA3Y8	*Mathematical Logic* ‡	10	H

‡ Only a selection of these will be given in any particular year.

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 C level 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 to have 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.

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

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, the Careers Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

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.

Educational aims of the programme
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.

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:	**Teaching/learning methods and strategies**
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.	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:	**Teaching/learning methods and strategies**
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.	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 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.

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 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.

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.

Teaching/learning methods and strategies
The use of IT is embedded throughout the computational side of the mathematics course, in the package *Mathematica* taught in Part 1 mathematics, 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.