BSc Meteorology and Climate **UCAS code: F790**
For students entering Part 1 in 2011/2

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	ES3
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	15/May/2013
Programme Director:	Dr Peter Inness
Programme Advisor:	Dr Peter Inness
Board of Studies:	School of Mathematical and Physical Sciences
Undergraduate Accreditation:	The programme outlined here is approved by the Royal Meteorological Society as an appropriate academic training for meteorologists seeking the qualification *Chartered Meteorologist*.

Summary of programme aims
The programme aims to provide a thorough degree-level education in environmental physical science, with emphasis on the physics of the Earth's atmosphere and oceans. It also aims to provide graduates with sufficient degree level knowledge of applied physics and mathematics to enable them to pursue a career outside the specialist areas of meteorology and oceanography.

Transferable skills
During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills. In following this programme, students will have had the opportunity to develop such skills, in particular relating to communication, interpersonal skills, learning skills, numeracy, self-management, use of IT and problem-solving 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 and show competence in the following transferable skills: IT (word-processing, using spreadsheet and graphical applications programs, scientific programming, internet), scientific writing, oral presentation, experimental methods (laboratory and field), team-working, use of library resources, project planning, career planning and management, and business awareness.

Programme content
The profile that 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 optional modules). Students must choose such additional modules as they wish, in consultation with the Programme Director, to make 120 credits in each Part. The number of module credits for each module is shown after its title.

Part 1 (three terms)
Compulsory modules

Code	*Module title*	*Credits*	*Level*
MT12C	Skills for Environmental Science	20	4
MT11C	Introduction to Meteorology	20	4
MT11D	Weather and Climate Fundamentals	20	4
MA1CAL	Calculus Methods	20	4
MA1VM	Vectors and Matrices	10	4
MA1OD1	Ordinary Differential Equations I	10	4

Optional modules (select 20 credits)

MA1AN1	Analysis I	20	4
PH101	Physics of the Natural World	20	4
ES1D1	Earth Structure and Processes	10	4

ES1D2	Earth Materials	10	4
SS1A1	Introduction to Soil Science	10	4

Part 2 (three terms)
Compulsory modules

Code	*Module title*	*Credits*	*Level*
MT24A	Atmosphere and Ocean Dynamics	20	5
MT24B	Atmospheric Physics	20	5
MT24C	Numerical Methods for Environmental Science	10	5
MT25D	Skills for Graduates	10	5
MA2OD2	Ordinary Differential Equations II	10	5
MA2PDM	Partial Differential Equations for Meteorology	10	5
MT26E	Surface Energy Exchange	10	5
MT25F	Atmospheric Analogues	10	5

Optional modules

Optional modules are subject to pre-requisites stated in the Module Descriptions.
Students must select one or more Level 5 modules to the value of 20 credits in subject areas from the list below, subject to pre-requisites in some cases. Alternatively, students may select a Level 4 module (for 20 credits) in a foreign language offered by the Institutional Wide Language Programme (IWLP).

ES2M5	Global Quaternary Climate Change	10	5
MA2AN2	Analysis II	20	5
MT24E	Weather Forecasting	10	5
ES2D5	Sustainable Resource Management	10	5
LA1XX1	Institution Wide Language Programme	20	4

Part 3 (three terms)
Compulsory modules

Code	*Module title*	*Credits*	*Level*
MT37A	Part 3 Project	30	6
MT37B	General Studies	10	6
MT37J	Boundary Layer Meteorology	20	6

Optional modules (select 60 credits from the following list)

ST2S2	Applied Statistics for Life Sciences	10	5
MT37D	Remote Sensing Methods and Applications	10	6
MT37E	Dynamics of Weather Systems	10	6
MT37F	Oceanography	10	6
MT37H *	Atmospheric Science Field Course (Arran)	10	6
MT38A	The Global Circulation	10	6
MT38B	Climate Change	10	6

MT38C	Numerical Weather Predictions	10	6
MT38E	Atmospheric Electricity	20	6

*MT37H has a maximum class size of 16 people including those taking MT4XH. You will be contacted to register your interest. If more than 16 people wish to take part, selection will be made by random draw.

Progression requirements
To gain a threshold performance at Part 1 a student shall normally be required to achieve an overall average of at least 40% over 120 credits taken in Part 1, 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 additionally obtain at least 40% in the Meteorology modules averaged together and not less than 30% in each of the modules MT11C, MT11D and MT12C.

To gain a threshold performance at Part 2, 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.
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Assessment and classification
The University's honours classification scheme is:

Mark	*Interpretation*
70% - 100%	First class
60% - 69%	Upper Second class
50% - 59%	Lower Second class
40% - 49%	Third class
35% - 39%	Below Honours Standard
0% - 34%	Fail

For the University-wide framework for classification, which includes details of the classification method, please see: www.reading.ac.uk/internal/exams/Policies/exa-class.aspx.

The weighting of the Parts/Years in the calculation of the degree classification is

Three-year programmes
Part 2 one-third
Part 3 two-thirds

Teaching is organised in modules that typically involve lectures, problem solving classes, and practical classes. The assessment is carried out within the University's degree classification scheme, details of which are provided elsewhere. The pass mark in each module is 40%. Parts 1 and 2 are assessed by a mixture of coursework and formal examination. In Part 3 there are some modules that are assessed wholly by coursework and others wholly by examination: the details are given in the module descriptions. The Part 3 project involves a substantial component of independent learning, under the supervision and guidance of a Project Supervisor. The project is assessed on the basis of formal reports, oral presentations and development of independent learning skills.

Please note that the University reserves the right to retain samples of coursework for the purposes of internal and external programme review.

You will be required to undertake a substantial independent piece of work (MT37A) during Part 3 that will involve settling on a topic and supervisor during the Summer Term of Part 2. Notes of guidance on the preparation and submission of such a dissertation will be given to you by the Undergraduate Programme Director for Meteorology. You will also have an introductory lecture at the start of the Autumn Term about how to go about tackling the work.

Your Programme Handbook offers general advice (below) relevant to your subject. If you have any queries or require further information, you should consult the relevant lecturers or your tutor.

Admission requirements
Entrants to this programme are normally required to have obtained:
Grade C or better in English, Science and Mathematics in GCSE;
Either A/AS level: 320 points including an AB combination in physics and mathematics (both A2 levels) and 100 points from another A level or other AS levels;
or International Baccalaureat: 33 points including 6 in Physics and 6 in Mathematics;
or Scottish Advanced Highers: 320 points with an AB combination in physics and mathematics plus the remainder from another Advanced Higher or other Highers;
or Irish Leaving Certificate: two grade As (in Maths and Physics) and three grade Bs in any other subjects;
or equivalent qualifications from other national exam systems etc.

Vocational international students without the above qualifications may be admitted via a 1-year International Foundation Programme, provided by the Department of Continuing Education.

Admissions Tutor: Dr Pete Inness

Support for students and their learning
University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, the Careers, Placement and Experience Centre (CPEC), In-sessional English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and 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 advisers in the Student Services Centre. The Student Services Centre is housed in the Carrington Building and offers advice on accommodation, careers, disability, finance, and wellbeing, academic issues (eg problems with module selection) and exam related queries. 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 and runs workshops and seminars on a range of topics. For more information see www.reading.ac.uk/student

Within the providing Departments additional support is given through practical classes and problem solving classes. The Department of Meteorology Library holds all textbooks used in connection with the programme, and also contains a Learning Resource Centre containing additional material such as course notes, reprints of important papers, and past examination papers. There is a Course Adviser to offer advice on the choice of modules within the programme.

Career prospects
Graduates gaining a good honours degree are suitably qualified for graduate entry into the UK Met Office, where they may pursue a career in either operational meteorology or research. The British Antarctic Survey, the Centre for Ecology and Hydrology and the Environment Agency are examples of agencies providing employment to graduates wishing to specialise in the applications of meteorology. Opportunities also exist in the general area of environmental consultancy, both with local authorities (in the UK) and private companies. However, a graduate in Meteorology is also qualified to follow a career involving more general applications of physical science and mathematics, as in teaching (primary or secondary level), the scientific civil service, and industry.

Opportunities for study abroad or for placements
The four-year MMet programme with the final year in Oklahoma is well-established in the Department. Students who may wish to study elsewhere for a period should first discuss the matter with their tutor.

Students also discuss their modules and more general teaching and learning matters regularly during their termly meeting with their tutor.

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 application of physical and mathematical methods to the description, modelling and prediction of physical phenomena in the atmosphere and oceans 2. More specialist topics relating to the Earth's climate system of current research interest 3. Impacts of weather, climate and climate change on society and ecology.	The knowledge required for the basic topics is delineated in formal lectures supported by problem sets for students to tackle on their own. The knowledge required for more specialist topics is enhanced through self-learning based on guided reading, problem solving and project work. The knowledge required for 3 is gained from weekly discussion classes during part 3. Feedback on most of 1 and 2 is provided through formative assessed work. *Assessment* Most knowledge is tested through a combination of coursework and unseen formal examinations. Dissertation and oral presentation also contribute.

Skills and other attributes

B. Intellectual skills - *able to:*	**Teaching/learning methods and strategies**
1. Recognise and use subject-specific theories, paradigms, concepts and principles 2. Analyse, synthesise and summarise information critically 3. Apply knowledge and understanding to address familiar and unfamiliar problems 4. Collect and integrate evidence to formulate and test hypotheses 5. Identify and understand moral and ethical issues relating to the subject area	Most modules are designed to develop 1 and 2. 1, 2 and 3 are enhanced through the use of coursework assignments, fieldwork and project work. 4 is enhanced mainly by project work. 5 is addressed in discussion classes. *Assessment* 1-3 are assessed indirectly in most parts of the programme. 4 is assessed in the part 3 project. 5 is assessed by a General Paper.
C. Practical skills - *able to:*	**Teaching/learning methods and strategies**
1. Planning, conducting, and reporting on investigations, including the use of secondary data 2. Collecting, recording and analysing data using appropriate techniques in the field and laboratory 3. Undertake field and laboratory investigations in a responsible and safe manner 4. Referencing work in an appropriate manner,.	Laboratory, IT, and field classes are designed to enhance skills 1 and 2. 3 is emphasised through guidelines and advice given to students in connection with practical work. 4. is emphasised through guidelines issued to students in connection with project work. *Assessment* 1 and 2 are tested formatively in coursework connected with laboratory and field classes. 3 is not assessed. 4 is assessed as part of the part 3 project report.
D. Transferable skills - *able to:*	**Teaching/learning methods and strategies**
1. Communication: the ability to communicate knowledge effectively through written and oral presentations. 2. Numeracy and C and IT: appreciating issues relating to the selection and reliability of field and	Skills listed under 1 and 2 are developed throughout most of the programme, but especially through practical work, field classes and project work. 3 is encouraged through team-working within laboratory and field classes. 4 is enhanced partly through the

laboratory data; preparing, processing, interpreting and presenting data; solving numerical problems using computer and non-computer based techniques; using the Internet critically as a source of information
3. Interpersonal skills: ability to work with others as a team, share knowledge effectively; recognise and respect the views and opinions of other team members
4. Self management and professional development: study skills, independent learning, time management, identifying and working towards targets for personal, academic and career development
5. Library skills: the effective use of library resources.

provision of a Career Development Skills module during part 2, and partly through a PAR tutorial system. 5 is covered by a study skills module.

Assessment
1 is assessed directly as an outcome of project work, and contributes to the assessment of practical work. 2 is assessed indirectly, mainly in connection with laboratory and field classes. Skills in 3, 4 and 5 are also assessed and their effective use will enhance performance in H level modules.

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.