

**MSc in Applied Meteorology and Climate with Management (full-time)**  
**For students entering in 2017/8**

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	
Programme length:	12 months
Date of specification:	17/Aug/2017
Programme Director:	Dr Tom Frame
Board of Studies:	School of MPS PG taught programmes
Accreditation:	The programme is approved by the Royal Meteorological Society as appropriate training for meteorologists seeking the qualification <i>Chartered Meteorologist</i> .

**Summary of programme aims**

The aim of the *Applied Meteorology and Climate with Management* MSc programme is to provide the scientific background for improved understanding of the broad aspects of meteorology and climate. In addition because the course is aimed at those with current or future managerial responsibilities there is a significant course element which focuses on the management of people and organisations.

**Transferable skills**

The following transferable skills should be gained by students during this degree programme

- Presentation skills (written and oral)
- Design of research project
- Word-processing
- Writing technical reports
- Team working
- Solving numerical problems related to environmental science
- Reviewing and synthesizing information in a specific field of interest
- Practical measurement skills
- Applications of standard software packages (spreadsheets, databases, image analysis) to environmental science
- Accessing academic and technical information via library and online facilities
- People and organisation management
- Interpreting and communicating complex information to non-specialists

**Programme content**

The modules offered as part of the taught part of the programme are listed below.

**Autumn Term**

Code	Title	Compulsory (C), Optional (O)	Credit	Level
MMM048	Managing people and organisations	C	20	7
MTMG02	Atmospheric physics	C	10	7
MTMG05	Professional skills 1 - Weather analysis/forecasting	C		7
MTMA33	Introduction to computing	C	10	7
MTMG34	Experiencing the weather	C	10	7
MTMA39	Forecasting systems & applications	C	10	7
MTMG04	Weather & climate discussion	C	0	

**Spring Term**

Code	Title	Compulsory (C), Optional (O)	Credit	Level
MMM020	Leadership theory and practice	O	20	7
MTMD01	Environmental data exploration	O	10	7
MTMG05	Professional skills 2 - Team project	C		7
MTMG06	Statistics for weather & climate science	O	10	7
MTMG16	Climate change	O	10	7

MTMG19	Tropical weather systems	O	10	7
MTMG25	Hazardous weather	O	10	7
MTMG38	Remote sensing	O	10	7
GVMPFF	Preparing for floods	O	10	7
MTMG04	Weather & climate discussion	C	0	7

### Summer Term

Code	Title	Compulsory (C), Optional (O)	Credit	Level
MTMG05	Professional skills 3 - Met Office forecasting course	C	10	7
MTMG99	Dissertation (MSc), Essay (Diploma)	C	60 (MSc, 30 (Dip))	7
MTMG04	Weather & climate discussion	C	0	

Notes on module listing

Where a module is taken over more than one term (e.g. MTMG05) the credit weighting is given in the final entry only.

### 1. Specification for MSc

Students must complete all compulsory modules (130 credits) plus modules in the Spring Term from those marked as optional (50 credits). A dissertation worth 60 credits must be completed by the middle of August.  
*Total credit value of MSc = 180.*

### 2. Specification for Diploma

Students must complete all core taught modules (70 credits), then the following two routes are available:

#### EITHER:

Students must choose modules in the Spring Term to the value of 50 credits

#### OR

Students must choose one or more modules in the Spring Term worth a total of 20 credits and complete an extended essay worth 30 credits by the end of June.

*Total credit value of Diploma = 120.*

### 1. Specification for Certificate

Students must complete all assessed modules (60 credits) in the Autumn Term or a combination of modules from the Autumn and Spring Terms.

*Total credit value of Certificate = 60.*

### Part-time or modular arrangements

This programme is not currently available part-time.

### Progression requirements

Not applicable for MSc programme

### Summary of Teaching and Assessment

The programme is in three major sections.

1. The Autumn Term provides an introduction to the science of meteorology and of the management of individuals and organisations. No prior knowledge of the subjects is assumed, but it is expected that students are familiar with the relevant mathematics and physics for the meteorology modules. Autumn Term modules are assessed partly by coursework (including a fieldwork report) and partly by examinations taken at the end of the Christmas vacation. The sixth week of term is the first skills week in which there is no teaching of other modules but instead students focus on compulsory lectures and workshops which help to enhance their professional development.

2. More advanced and specialised modules are presented in the Spring Term. The modules are assessed partly by coursework and partly by examination at the end of the Easter Vacation. The sixth week of term is the second skills week in which a 'Team Project' (MTMG05), is undertaken by students working together in small groups. The whole week is devoted to researching and presenting this project. Assessment is based on a written report and an oral presentation.

3. The first or second week of term is the third skills week in which students undertake a week of practical forecaster training delivered by colleagues from the Met Office. After completing this course, almost all student time is spent (for MSc students) in preparing a dissertation on a selected topic which must be completed by mid-August or (for some Diploma students) in preparing an extended essay on a selected topic which must be completed by the end of June. In both cases, the student chooses the topic in consultation with members of staff. The MSc dissertation must contain a substantial review of current and recent research in the chosen field and will usually contain some original research in the form of experimental work and/or data analysis for example. Students will be asked to give a brief oral, non-assessed, presentation on their progress around the end of the summer term.

The Diploma essay will normally be a literature review.

Most of the students on the Applied Meteorology and Climate with Management course are sponsored by the World Meteorological Organisation (WMO), and sponsorship includes payment - additional support to attend events at the UK Met Office and the Royal Meteorological Society student conference.

Throughout the year, students are encouraged to attend departmental seminars and are expected to attend the Weather & Climate Discussion (MTMG04) held weekly in term time. The Professional Studies module (MTMG05) involves in part a series of seminars and visits to relevant institutions organised especially for MSc students who are expected to attend. While these activities are not examined, they are an important component of the student's education. They contribute to their general understanding and to possible choices of dissertation topic and career.

Much of the teaching on the programme is in common with the other MSc programmes. First year PhD students and, occasionally, Met Office staff also attend modules so class sizes may be as high as 50 in the Autumn Term when all modules are core. In the Spring Term, when students choose from a range of options, class size is typically 10 to 20.

### **Programme classification**

The University's taught postgraduate marks classification is as follows:

Mark	Interpretation
70% - 100%	Distinction
60% - 69%	Merit
50% - 59%	Good standard (Pass)

### **Failing categories**

40% - 49%	Work below threshold standard
0% - 39%	Unsatisfactory Work

### *For Masters Degrees*

#### **Distinction:**

- A weighted average mark of 70 or more over 180 credits
- AND
- a mark of 60 or more for the dissertation

AND

- no mark below 40.

**Merit:**

- A weighted average mark of 60 - 69 over 180 credits

AND

- a mark of 50 or more for the dissertation

AND

- no mark below 40.

**Pass:**

- A weighted average mark of 50 - 59 over 180 credits

AND

- a mark of 50 or more for the dissertation

AND

- no significant weakness (i.e. no mark below 40 in modules agreed at validation to be of special significance to the programme)

AND

- no absolute weakness (ie the total credit value summed for all modules marked below 40 does not exceed 30 credits and for all modules marked below 50 does not exceed 55 credits)\*.

**Failed**

- A performance that fails to fulfil the criteria for the above classifications.

*Postgraduate Diploma*

A diploma is awarded on successful completion of 120 module credits.

Students must complete all compulsory modules (70 credits) and then either of the following two routes are possible:

- Students must complete FIVE optional modules in the Spring Term (50 credits)
- Students must choose TWO modules in the Spring Term from those marked optional (20 credits) and complete an extended essay of about 10,000 words on a topic chosen in consultation with a member of staff. The extended essay is worth 30 credits and must be submitted by the end of June.

**Distinction:**

- A weighted average mark of 70 or more over 120 credits
- AND
- no mark below 40.

**Merit:**

- A weighted average mark of 60 - 69 over 120 credits

AND

- no mark below 40.

**Passed:**

- A weighted average mark of 50 - 59 over 120 credits

AND

- no significant weakness (ie no mark below 40 in modules agreed at validation to be of special significance to the programme)

AND

- no absolute weakness (ie the total credit value summed for all modules marked below 40 does not exceed 30 credits and for all modules marked below 50 does not exceed 55 credits)\*.

**Failed**

- A performance which fails to fulfil the criteria for the above classifications.

*Postgraduate Certificate*

A certificate is awarded on successful completion of 60 module credits.

Students must complete all assessed modules (60 credits) in the Autumn Term or a combination of modules from the Autumn and Spring Terms. To pass the Postgraduate Certificate students must gain an average mark of 50 or more. In addition the total credit value of all modules marked below 40 must not exceed 10 credits\*.

\*Note: the provision to permit a candidate to be passed overall with a profile containing marks below 40 is made subject to the condition that there is evidence that the candidate has applied him or herself to the work of those modules with reasonable diligence and has not been absent from an examination, for example, without reasonable cause.

### **Admission requirements**

Entrants to this programme must normally require to have obtained a second-class honours degree in a physical, environmental or engineering science, and A-level (or equivalent) maths and/or physics. Candidates with other qualifications who have significant professional experience may be considered and should discuss their background with the Admissions Tutor, Dr David Ferreira (d.g.ferreira@reading.ac.uk) or the Programme Director, Dr Thomas Frame (t.h.a.frame@reading.ac.uk).

Many of candidates enter the MSc programme after winning support from the World Meteorological Organisation (WMO) in the form of a Fellowship. This however does not exclude other candidates.

Applicants whose first language is not English may be required to demonstrate their evidence of proficiency in English with IELTS or alternative English language qualifications. Applicants will be notified as required.

**Admissions Tutor:** Dr David Ferreira

### **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, In-sessional English Support Programme, the Study Advice and Mathematics Support teams and IT Services. 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 Support Centres. If a student has a general enquiry and is unsure where to seek help, they should visit their Support Centre. There are five Support Centres across the University, including one based at the London Road Campus. The Support Centre will be able to advise on matters such as extenuating circumstances, module selection, suspensions, withdrawals, timetable queries and transferring programme. The Support Centre will also be able to signpost students to Carrington building where other University services related to disability, financial support, counselling and wellbeing, accommodation and careers can be found. More information on what student services are available can be found here: <http://student.reading.ac.uk/essentials>.

The Department of Meteorology provides modern laboratory facilities and an atmospheric observatory for teaching purposes. In addition to the central University facilities, the Department has its own PC labs for teaching and student use and a professionally staffed library with copies of all recommended texts and runs of major meteorological periodicals. The Meteorology Department library houses a learning resource centre and adjacent to the library is a purpose-designed student study area.

Learning support is provided by a tutor system and optional class tutorials given with some modules. Each student is assigned a tutor at the start of the programme. Tutorial groups normally consist of three or four students. Weekly tutorials are compulsory during the Autumn Term and thereafter may be continued if desired by mutual agreement between tutor and tutees. For team projects and the dissertation, guidance is given by a project supervisor.

Pre-requisite self-teaching material is provided on our website (<http://www.met.reading.ac.uk/pg-taught/pg-prerequisites.html>) and we encourage all students to look through this material prior to beginning the course.

During welcome week we offer a range of optional tutorials to brush up on skills in mathematics, physics and computing in preparation for the course and have additional tutorials to support students in these topics throughout the Autumn Term taught by post-doctoral researchers.

### **Career prospects**

All students who have attended this course either returned to careers with their home Met Services or went on to further study.

### **Opportunities for study abroad or for placements**

### **Programme Outcomes**

#### **Knowledge and Understanding**

##### **A. Knowledge and understanding of:**

1. The physical processes which drive the atmospheric system giving rise to weather and climate
2. The feedback between the Earth's surface and the atmosphere and the impact of these feedback processes on weather, climate and land surface characteristics
3. Methods of measurement and data analysis appropriate to monitoring atmospheric processes and an appreciation of the limitations and uncertainties of the measurements and data
4. Impacts of weather, climate and climate change on society and ecology
5. Advanced, specialist weather and climate topics
6. The interface between climate science/environmental issues and advising policy decision makers
7. The way in which individuals and organisations are managed effectively.

##### **Teaching/learning methods and strategies**

Knowledge and understanding for items 1 to 5 is achieved through lectures, seminars, discussions, tutorials and computer laboratories. Lectures often include problem sheets and guided reading as additional material.

In addition, knowledge and understanding of measurement techniques (3) is gained through laboratory classes and a field course.

In addition to taught modules, item 5 is achieved by independent reading and library searching for the dissertation and team project.

##### *Assessment*

Knowledge is tested through written assignments, project reports and examinations as well as oral presentations.

#### **Skills and other attributes**

##### **B. Intellectual skills - able to:**

1. Apply knowledge and understanding gained to a variety of familiar and unfamiliar situations
2. Analyse data with a critical awareness of possible weaknesses and uncertainties
3. Formulate and test hypotheses
4. Show independence and initiative in approaches to problem solving
5. Present conclusions clearly to expert and non-expert audiences in written and oral forms
6. Critically review, synthesise and evaluate published research.

##### **Teaching/learning methods and strategies**

1, 2 3 and 4 are developed by a combination of problem sheets, worked examples, coursework assignments, computing classes project work and dissertation.

5 is addressed through lectures, tutorials and also through team project and dissertation reports and presentations.

6 is covered in lectures and through the team project and dissertation.

##### *Assessment*

1 and 2 are assessed through coursework and exams. 3, 4 and 5 are mainly assessed through team project and dissertation presentations and reports.

##### **C. Practical skills - able to:**

1. Plan, conduct, and report on investigations,

##### **Teaching/learning methods and strategies**

Laboratory, IT, field work and field classes are

- including the use of secondary data
- 2. Collect, record and analyse data using appropriate techniques in the field and laboratory
- 3. Undertake field and laboratory investigations in a responsible and safe manner
- 4. Reference work in an appropriate manner
- 5. Develop practical expertise in managing staff and organisations

designed to enhance skills 1 and 2.

3 is emphasised through guidelines and advice given to students in connection with practical work and the field course.

4. is emphasised through guidelines issued to students in connection with project and dissertation work.

#### *Assessment*

1 and 2 are tested formatively in coursework connected with laboratory and field classes. 3 is not assessed. 4 is assessed in team project and dissertation, 5 in essays and group presentations

#### **D. Transferable skills - able to:**

- 1. Communicate: the ability to communicate knowledge effectively through written and oral presentations
- 2. Appreciate issues relating to the selection and reliability of field and 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 - Numeracy and C & I
- 3. Work with others as a team, share knowledge effectively; recognise and respect the views and opinions of other team members - Interpersonal skills.
- 4. Manage personal and professional development: study skills, independent learning, time management, personal responsibility and decision making in complex situations.
- 5. Effectively use library resources - library skills.

#### **Teaching/learning methods and strategies**

Skill listed under 1 and 2 are developed throughout most of the programme, but especially through practical work, field course, team project and dissertation . 3 is encouraged through team-working within laboratory, field course and team project. 4 is encouraged throughout the programme and particularly in the team project and dissertation. 5 is covered by a study skills module and practiced in tutorials, team project and dissertation.

#### *Assessment*

1 is assessed through coursework, exams, project work and dissertation. 2 is assessed through laboratory, field course and computing modules and in the team project and dissertation. 3 is indirectly assessed in the field course and team project. 4 and 5 are indirectly assessed in coursework assignments, team project and dissertation.

**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.**