

## SECTION 2: PROGRAMME SPECIFICATION

1	<b>Awarding institution/body</b> <i>University of Worcester</i>		
2	<b>Teaching institution</b> <i>University of Worcester</i>		
3	<b>Programme accredited by</b> <i>N/A</i>		
4	<b>Final award</b> <i>PG Certificate, PG Diploma and MSc</i>		
5	<b>Programme title</b> <i>Airborne Infectious Agents and Allergens</i>		
6	<b>Pathways available</b> <i>N/A</i>		
7	<b>Mode and/or site of delivery</b> <i>Taught</i>		
8	<b>Mode of attendance</b> <i>Full time and part time</i>		
9	<b>UCAS Code</b> <i>N/A</i>		
10	<b>Subject /Professional Benchmark statements</b> <i>N/A</i>		
11	<b>Date of Programme Specification preparation</b> <i>May 2011</i>		
12	<p><b>Educational aims of the programme</b></p> <p>The demand for understanding the impact of airborne infectious diseases on humans, animals and plants is increasing. Pharmaceutical, biotechnology and agricultural companies are investing in the development of new products against allergens and disease causing agents and, as a result, postgraduates with a degree in this field are in high demand both in the UK and internationally. The National Pollen and Aerobiology Research Unit (NPARU) is a designated research centre of the University of Worcester (UW) and is involved in Health, Science, Environment and Forensics. NPARU primarily conducts research and consultancy on topics including air quality and health, pollen monitoring and forecasts for the UK media and Met office, respiratory allergies, forensic palynology, testing appliances for allergen removal/reduction, molecular and immunological detection and diagnostics of microorganisms and host-microbe interactions. NPARU is unique in the UK and has earned a national and international reputation for its combination of expertise in allergens, aerobiology, indoor air quality and medical knowledge. NPARU has first class teaching facilities, molecular, immunological, microbial, forensics and imaging laboratories. In the last Research Assessment Exercise (RAE), work in ISE has been recognised as being internationally excellent in terms of originality, significance and rigour. Individuals within NPARU are world leaders in their field. The Unit has strong links with agricultural, medical and biotech industry, clinical trials and international centres.</p> <p>This programme reflects the research excellence within NPARU.</p> <p>The specific educational aims of the course are designed to enable postgraduates to:</p> <ul style="list-style-type: none"> <li>• Pursue a career in industry, academic research or publicly funded institutions in the UK or overseas in the field of life sciences, particularly allergens and infectious agents;</li> <li>• Critically engage with the fundamental principles underlying pollen and pollen biotechnology, allergens and infectious agents;</li> <li>• Go on to study for a PhD;</li> <li>• Meet the global need for highly trained individuals who understand the impact of airborne particles on plant, animal and human health;</li> <li>• Conduct modern diagnostic research using appropriate techniques;</li> <li>• Think for themselves and to develop a critical approach to the analysis of data and interpretation of published research;</li> <li>• Conduct skilled laboratory and research work;</li> <li>• Enjoy a supportive and challenging learning environment.</li> </ul>		
13	<p><b>Intended learning outcomes</b></p> <table border="1"> <tr> <td> <p><b>Knowledge and understanding:</b></p> <p>By the end of the programme, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Identify fundamentals of infectious agents, their dispersal mechanism and modes of infection;</li> <li>2. Critically evaluate the impact of these microbial agents on human, animal and plants at the molecular and cellular level;</li> <li>3. Apply and justify the use of appropriate detection and diagnostics methods to identify</li> </ol> </td> <td> <p><b>Examples of learning, teaching and assessment methods used:</b></p> <p>Students will develop 1 to 8 through a combination of lectures, laboratory work, tutorials and seminars, and groupwork. Development of points 9 to 11 is achieved largely through laboratory and computer-based work, and journal club sessions. Also during last 4 months of the course, students will carry out an individual, supervised</p> </td> </tr> </table>	<p><b>Knowledge and understanding:</b></p> <p>By the end of the programme, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Identify fundamentals of infectious agents, their dispersal mechanism and modes of infection;</li> <li>2. Critically evaluate the impact of these microbial agents on human, animal and plants at the molecular and cellular level;</li> <li>3. Apply and justify the use of appropriate detection and diagnostics methods to identify</li> </ol>	<p><b>Examples of learning, teaching and assessment methods used:</b></p> <p>Students will develop 1 to 8 through a combination of lectures, laboratory work, tutorials and seminars, and groupwork. Development of points 9 to 11 is achieved largely through laboratory and computer-based work, and journal club sessions. Also during last 4 months of the course, students will carry out an individual, supervised</p>
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<p>microorganisms;</p> <ol style="list-style-type: none"> <li>4. Design early warning systems for disease forecasting for potential epidemics;</li> <li>5. Acquire daily pollen and airborne particle data;</li> <li>6. Critically evaluate systems for the identification of indoor and outdoor allergen carriers;</li> <li>7. Explain the mechanism of allergy development and management of allergy;</li> <li>8. Explain hay fever and asthma at a level at the cutting edge of disciplinary knowledge;</li> <li>9. Conduct effective independent laboratory-based research informed by practice at the cutting edge of the discipline;</li> <li>10. Establish laboratory methods for: immunology including antibody production and use, allergen detections, collection and analysis of airborne particles, product and device testing for allergen and bio aerosol detection including house dust mite;</li> <li>11. Design new research projects and justify decision processes, establish teamwork, and produce creative written reports and oral presentations suitable for a range of audiences.</li> </ol>	<p>research project.</p> <p>Formative and summative assessments methods will be employed in each module.</p>
<p><b>Cognitive and intellectual skills:</b> By the end of the programme, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Critically evaluate the role of microbial agents in disease development;</li> <li>2. Integrate and evaluate information and data from a variety of sources;</li> <li>3. Formulate and test hypotheses, creatively and rigorously;</li> <li>4. Creatively seek solutions to biological problems;</li> <li>5. Plan, conduct and report on a programme of research.</li> </ol>	<p><b>Examples of learning, teaching and assessment methods used:</b> Intellectual skills are developed through the teaching and learning programme outlined above.</p> <p>Analysis and problem solving skills are further developed through the journal club sessions, seminars and production of scientific posters.</p> <p>Experimental research skills are further developed through coursework activities, laboratory experiments and later on through research project. Assessment results will provide an important feedback on student's progress.</p> <p>Assessment of thinking skills is partly achieved through coursework, the individual research project, and practical assignments.</p>
<p><b>Practical skills relevant to employment:</b> By the end of the programme, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Apply bioinformatics for a wide range of biological problems;</li> <li>2. Establish the use of molecular biology techniques for different experiments;</li> <li>3. Critically evaluate data on pollen and airborne spores, and other particles.</li> </ol>	<p><b>Examples of learning, teaching and assessment methods used:</b> Students will experience laboratory-based research in Module 6 and will be assessed on the skills gained at this module.</p>
<p><b>Transferable/key skills:</b> By the end of the programme, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Communicate effectively through oral presentations and written reports to specialist and</li> </ol>	<p><b>Examples of learning, teaching and assessment methods used:</b> Modules will give opportunity to develop these key skills through individual and teamwork,</p>

non-specialist audiences;  
 2. Apply information literacy skills to identify and search online bioinformatic databases, analysis and integration methods at the cutting edge of the discipline;  
 3. Develop and practice ethical and confidential guidelines on data protection;  
 4. Transfer techniques and solutions from one discipline to another to deal with complex issues;  
 4. Apply communications technology effectively and appropriately to deliver scientific results to a broad audience;  
 5. Exercise initiative, take personal responsibility and practice self direction;  
 6. Learn independently with open-minded and critical enquiry and apply teamwork ability;  
 7. Learn effectively for the purpose of continuing professional development;  
 8. Comply with existing, and design new and appropriate, risk assessments and health and safety procedures.

presentations, workshops and laboratory-based practical classes.

#### **14 Assessment Strategy**

Each assessment item has published specific marking criteria contained in the module outline given to students at the beginning of the module. These are based on the generic assessment criteria contained within the [University of Worcester Student Handbook](#) and [University of Worcester grade descriptors](#).

The assessment strategy is designed to provide students with the knowledge and skills that are required to work in the field of Infectious Agents and Allergens. This will be achieved by formative and summative assessment.

##### Taught sessions

The course will incorporate a full range of assessment items - the mapping of assessment strategies to individual modules is included in the course handbook. Broadly speaking, the course structure of 6 20 credit modules plus a 60-credit Research project provides a sound background in infectious agents and allergy. Practical laboratory sessions dovetail with lecture content and introduce essential techniques in detection, diagnostics and treatment of infectious diseases and allergens. Work on, and feedback from, an essay, tutored dissertation and practical reports equips students with skills essential for writing the project report.

Each module will be assessed individually through different methods relevant to module, which will include seminar, practical reports, presentation, research reports, tutored dissertation and essays. Weighting for the modules is described in each module specification.

##### Research Project

Each MSc student will complete a 14-week research project. The project is designed to give practical experience of laboratory-based research and provide the opportunity to develop a wide range of skills. Research projects will be assessed by means of two presentations (20%) and the project report (80%).

MSc Students will be assessed by two presentations and a written report following completion of the project. One presentation will be on progress against a research plan, the final presentation will take place soon after submission of the report. The written report (normally less than 10,000 words in length, including tables, figures and references) will be independently assessed by the project supervisor and an affiliated teaching staff member.

## 15 Programme structures and requirements

### Structure

In summary the course will contain the following elements;

All part time and full time students will be required to attend an induction process during their first week which will include: registration, general orientation and tour of departmental facilities at the University, introduction to various staff, short presentations of work by key staff (involved in project supervision), library tour, and essential briefings on health and safety.

### Modules and award map

#### Level 7

Module code	Module title	Credit value
AIAA4001	Fundamental and translational aerobiology	20
AIAA4002	Detection and identification of microorganisms	20
AIAA4003	Impacts of infectious agents on plants, animals and humans	20
AIAA4004	Airborne allergens and allergen carriers	20
AIAA4005	Allergy diagnostics and management	20
AIAA4006	Research methods	20
AIAA4007	Research projects (Dissertation)	60

#### Full time over one year

**First semester:** AIAA4001- Fundamental and translational aerobiology; AIAA4002- Detection and identification of microorganisms; AIAA4003- Impacts of infectious agents on plants, animals and humans

**Second semester:** AIAA4004-Airborne allergens and allergen carriers; AIAA4005- Allergy diagnostics and management; AIAA4006- Research methods

**Third Semester:** AIAA4007-Research project (Dissertation).

Students who enrol for PG certificate will be able to choose combination of any 3 taught modules. Students who enrol for PG Diploma will only complete the taught modules, not Research Project.

#### Part time over two years

##### First year

At least three modules; either first semester or second semester modules

##### Second year

Remaining three modules and the Research project (for MSc only).

The module "Research Methods" will mainly be laboratory based practicals and Mini-Project work including

- a) Molecular biology workshops
- b) Collection of airborne particles
- c) Detection and Identification of pollens and spores
- d) Host-microbe interactions
- e) Spore and pollen forecasting
- f) Imaging including various forms of microscopy
- g) Bioinformatics Sessions
  - i) Navigating through plant and microbial databases
  - ii) Genome sequencing and annotation
  - iii) Generation of PCR-based markers

## **16 QAA Academic Infrastructure**

The Framework for Higher Education Qualifications (QAA 2008) has been used as reference point to develop the programme. Accordingly students receiving the Masters award will have demonstrated the following:

- a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their academic discipline, field of study, or area of professional practice;
- a comprehensive understanding of techniques applicable to their own research or advanced scholarship;
- originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline;
- conceptual understanding that enables the student:
  - a) to evaluate critically current research and advanced scholarship in the discipline; and
  - b) to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.

Typically, holders of the qualification will be able to:

- deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences;
- demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level;
- continue to advance their knowledge and understanding, and to develop new skills to a high level;

and will have the qualities and transferable skills necessary for employment requiring:

- the exercise of initiative and personal responsibility;
- decision-making in complex and unpredictable situations;
- the independent learning ability required for continuing professional development

## **17 Support for Students**

### Handbooks and Supporting Information

All students on the course will receive a Course Handbook and Module Outlines.

### Information and Learning Services

Information and Learning Services are based in the Pierson Library and provide library, media and IT support. The Library also hosts a range of appropriately focussed learning resources, including traditional library resources books and journals as well as a range of electronic resource materials. The University has subject specific librarians in Biological Sciences who will provide specific resource support for students on this programme. Relevant literature and other resources will also be provided by the module leaders.

### Media Services

Reprographic, laminating, binding and video editing services are available for use by students. There is a wide range of equipment available for student to use including DVD and video players, video and digital cameras and data projectors.

### Information Technology

Each student is allocated an email account to facilitate communication between peers and with tutors. In addition, students are registered on Blackboard, which allows access to a range of learning resources and information both on and off campus. There are networked computers available to students in both Hines Building and the Pierson Library, along with numerous drop-in computer rooms.

Three hot desks will be provided in National Pollen and Research Unit (NPARU) for student use. The majority of the course and laboratory works will be carried out in NPARU.

### Student Services

The University is committed to supporting the student experience and to this end has a range of student services; counselling service, financial advice, childcare provision, careers advice, disability and Dyslexia services. MSc course management team will ensure that pastoral care for students are provided.

## **18 Admissions policy, criteria and procedures**

### **Admissions Policy**

The University aims to be accessible; it is committed to widening participation and encouraging diversity in the student population. The Institute of Science and the Environment works closely with central student support services, including the Admissions Office, the Disability and Dyslexia Service and the International Office, to support students from a variety of backgrounds. We actively encourage and welcome people from the widest range of economic and cultural backgrounds, and value the contribution of mature learners. Admission to the course is in Semester 1 only of the academic year.

### **Entry requirements**

Candidates will be expected to hold a good first degree (normally at least an lower second) from a UK university or an equivalent qualification if obtained outside the UK in science based subjects including microbiology, biological sciences, plant sciences, environmental and medical sciences and other relevant areas.

Candidates who met the entry requirements will be assessed through references and interviewed, either in person or, if appropriate, by telephone.

In line with University of Worcester policy, students whose native language is not English and who did not undertake their undergraduate degree in English will be expected to pass the

British Council IELTS test at grade 6.5 or above including a score of 6.0 or better in the written and spoken English elements of the academic test. An acceptable alternative is TOEFL qualification with a score of not less than 90 overall in the internet-based test (iBT), to include 24 in Writing and 20 in Speaking; or 600 in the paper-based test (PBT), or 250 in the computer-based test (CBT), both to include a minimum score of 4.5 in the written English.

#### **Accreditation of Prior Learning.**

Students with relevant previous study at postgraduate level or with extensive experience may be considered eligible for accreditation of prior learning.

Please contact the Registry Admissions Office for further information or guidance on 01905 855111.

### **3. Methods for evaluating and improving the quality and standards of teaching and learning**

The external examiner system and Boards of Examiners are central to the process by which the University monitors the reliability and validity of its assessment procedures and academic standards. Boards of Examiners comment on the assessment procedures within the Institute of Science and the Environment (ISE) and may suggest improvements for action by relevant Institute Teaching Committees.

#### **Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards:**

- Student evaluation of modules based on feedback questionnaires.
- Course Management Committee held each Semester, reporting to the MSc Management Team
- Annual staff appraisal.

## **20 Regulation of assessment**

#### **Requirements to pass modules**

- Modules are assessed using a variety of assessment activities which are detailed in the module specifications.
- The minimum pass mark is 50% for each module.
- Students are required to submit all items of assessment in order to pass a module, and in some modules, a pass mark in each item of assessment may be required.
- All modules have at least 80% attendance requirements.
- Full details of the assessment requirements for a module, including the assessment criteria, are published in the module outline.

#### **Submission of assessment items**

- Students who submit course work late but within 5 days of the due date will have work marked, but the grade will be capped at 50% unless an application for mitigating circumstances is accepted.
- Students who submit work later than 5 days but within 14 days of the due date will not have work marked unless they have submitted a valid claim of mitigating circumstances.
- Students who fail to submit an item of assessment lose their right to reassessment in that module, and will be required to retake the module, which will incur payment of the module fee.
- For full details of submission regulations see Postgraduate Regulatory Framework.

#### **Retrieval of failure**

- Students are entitled to re-sit failed assessment items for any module that is awarded a fail grade, unless the failure was due to non-attendance or non-submission.
- Reassessment takes place during the following semester or during the summer reassessment period at the end of the academic year.
- If following reassessment the module has been passed, the module grade will be capped at 50%.
- If a student is unsuccessful in the reassessment, they will have one further and final reassessment opportunity.

- A student who fails 40 credits or more after exhausting all reassessment opportunities may be required to withdraw from the University.

### Requirements for Awards

Award	Requirement
PG Cert	Passed a minimum of 60 credits at level 7
PG Dip	Passed a minimum of 120 credits at level 7
MSc	Passed a minimum of 180 credits at level 7 including a minimum of 60 credits from the Dissertation

The awards of PG Cert, PG Dip or MSc in Airborne Infectious Agents and Allergens may be made with Pass, Merit or Distinction.

Students who enrol for PG certificate will be able to choose combination of any 3 taught modules.

### 21 Indicators of quality and standards

Key indicators of the quality and standards of the course will be:

- First destination data for MSc/PG Dip, and PG Cert graduates, showing a high proportion finding employment or further postgraduate research training in Life sciences
- External Examiner report

In March 2011, the University was audited by the Quality Assurance Agency. The audit confirmed confidence in the University's management of the quality of its academic programmes and the standards of its awards.

### 22 Employability and graduate destinations

Plant, animal and human health and well-being are permanent and increasingly important themes in our society. There are multiple determinants of this interest including food security, improved diagnostics for detecting infectious diseases and disorders, microbial contamination of seeds, water, and other resources, early warning of airborne allergenic particles including fungal spores, dusts and pollens. There is a high demand for skilled people by government and industry in molecular diagnostics, forensics, allergy, microbiology and molecular biology assisted plant breeding. NPARU has strong links with many of these areas and representatives have reacted positively to the development of this course. During the course, students will have opportunity to meet with different biotech companies. In addition, during the course, numerous scientists from a wide range of backgrounds will be invited to give scientific talks, which will provide opportunities for students to meet and discuss possible further works or careers, e.g. PhD in academia. NPARU is also an employer in this area.

Generally, Graduates of Life Sciences pursue a career either in academia or in industry. The integrated knowledge and training our students receive will provide a springboard for vocational careers in plant/animal science within the agricultural, medical and pharmaceutical industry, government and industrial research, and education. Our emphasis on high level academic attainment and the development of transferable skills will generate job opportunities in other aspects of natural sciences and other areas of employment.

**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 on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module outlines and Section 3 of the Course Handbook. The accuracy of the information contained in this document is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.