# MSc/Diploma in Plant Biotechnology

Awarding Institution:The University of ReadingTeaching Institution:The University of ReadingFaculty of Life SciencesProgramme length: 12 monthsFor students entering in 2003Date of specification: January 2004Programme Director:Dr A C WettenBoard of Studies:MSc in Plant Biotechnology and Food Biotechnology

## Summary of programme aims

The purpose of the course is to provide training in the science behind plant biotechnology, an appreciation of the current scope and limits to its industrial application, and the implications of modern methods of genetic modification for plant industries. The course runs in parallel to the MSc in Food Biotechnology and the common elements are designed to emphasise the continuity in the food chain from raw plant material to food products. The expected outcomes are that students should acquire and demonstrate:

- An understanding of the theoretical background knowledge in molecular, biochemical and plant sciences needed for an understanding of plant biotechnology.
- > A working knowledge of laboratory techniques used in plant biotechnology.
- An appreciation of the issues associated with growing and using transgenic plants as food crops.
- An understanding of the aims and needs of industrial enterprises using plant biotechnology techniques to develop new products.
- > A capacity to undertake research in plant biotechnology.

## Transferable skills

As part of this programme students are expected to gain or enhance their experience and competences in the following skills: IT (word-processing, use of spreadsheets and databases, use of Web resources), scientific writing, oral presentations, team working, problem solving, use of library resources and time management.

Programme cor	itent		
Mod Code	Module Title	Credits	Level
Compulsory	modules (160 credits)		
PSMAA7	Plant Biotechnology for Post-Harvest Quality	10	Μ
PSMH1A	Techniques for Plant Biotechnology 1	20	Μ
PSMAC7	Genetic Variation for Plant Breeding	10	Μ
FBMB03	Protein Structure and Function	10	Μ
PSMH2A	Molecular Plant Pathology	10	М
PSMH1B	Techniques in Plant Biotechnology 2	10	Μ
PSMHB8	SYNGENTA Module in Plant Biotechnology	10	Μ
FBMB02	Case Studies in Biotechnology	10	М
FBMB07	Biotechnology Challenge	10	М
PSMH2C	Research Project	60	М

Optional modules (20 credits - choose two from):-

PSMHH8	Plant Developmental Genetics and Physiology	10	М
PSMAA8	Biosynthesis of Major Crop Products	10	М
PSMAF8	Tissue Culture	10	М

### Part-time/Modular arrangements

The course may be taken part-time over two or more years. Modules PSMH1A and PSMAA7 should be taken in the first term. The other modules and the dissertation must be completed in the agreed period.

### **Progression requirements**

See appended progression requirements for students following a post-experience certificate.

### Summary of teaching and assessment

The teaching is organised in modules (totalling 180 credits) that involve a combination of lectures, tutorials, workshops, seminars, and practical sessions. Modules taken during the autumn and spring term (120 credits) will be assessed by a mixture of course work and formal examinations. The remaining 60 credits are allocated to a practical project or dissertation.

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

To pass the MSc students must gain an average mark of 50 or more overall including a mark of 50 or more for the dissertation. In addition the total credit value of all modules marked below 40 must not exceed 30 credits and for all modules marked below 50 must be less than 60 credits.\*

Students who gain an average mark of 70 or more overall including a mark of 70 or more for the dissertation and have no mark below 40 will be eligible for a Distinction. Those gaining an average mark of 60 or more overall including a mark of 60 or more for the dissertation and have no mark below 40 will be awarded eligible for a Merit.

## For PG Diplomas

To pass the Postgraduate Diploma 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 30 credits and for all modules marked below 50 must be less than 60 credits.\*

Students who gain an average mark of 70 or more and have no mark below 40 will be eligible for the award of a Distinction. Those gaining an average mark of 60 or more and have no mark below 40 will be awarded eligible for a Merit.

\*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 applied his or herself to the work of those modules with reasonable diligence and has not been absent from the examination without reasonable cause.

## **Admission requirements**

Entrants to this programme are normally required to have obtained an honours degree in a biological science subject, agriculture, horticulture, or environmental science, and to be able to show competence in areas of plant biochemistry, plant molecular biology, plant genetics and plant physiology necessary for effective progression. Applicants whose academic qualifications do not meet these requirements may in the first instance be admitted to a post-experience course; they may then transfer to MSc status if their performance during the first term is satisfactory.

### Admissions Tutor: Dr A C Wetten

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

### **Career prospects**

Graduates from the course are likely to find opportunities with industrial enterprises and institutions in the area of plant biotechnology, universities seeking graduates with pretraining for research to PhD level, and governmental, media and other organisations involved with biotechnology.

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

Students will be able to undertake the 50 credit project module at an approved institution or an appropriate industrial concern, but this will depend on having the necessary linguistic skills and finding a suitable placement, and appropriate supervisory arrangements being in place.

#### Educational aims of the programme

The purpose of the course is to provide training in the science behind plant biotechnology, an appreciation of the current scope and limits to its industrial application, and the implications of modern methods of genetic modification for plant industries. Participants will develop the analytical and practical skills needed for a career in research and development in plant biotechnology and related areas.

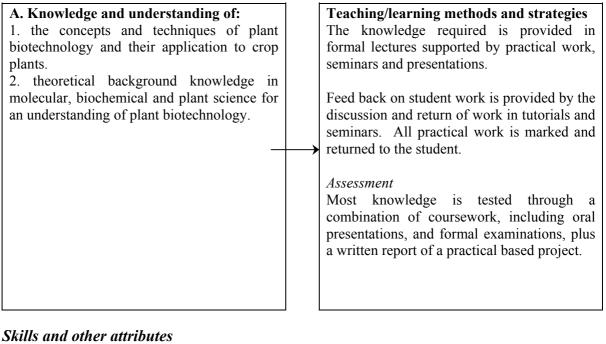
The expected course outcomes are that students should acquire and demonstrate:

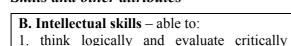
- An understanding of the theoretical background knowledge in molecular, biochemical and plant sciences needed for an understanding of plant biotechnology.
- > A working knowledge of laboratory techniques used in plant biotechnology.
- An appreciation of the issues associated with growing and using transgenic plants as food crops.

- An understanding of the aims and needs of industrial enterprises using plant biotechnology techniques to develop new products.
- > A capacity to undertake research in plant biotechnology and related topics.

## **Programme Outcomes**

#### Knowledge and Understanding





3. evaluate methodologies

independent practical project.

appropriate propose new hypotheses

discipline

discipline

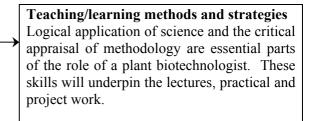
research and advance scholarship in the

2. plan and implement tasks at a professional

level to solve problems related to the

4. plan, conduct and write a report on an

and where



#### Assessment

1-3 are assessed directly and indirectly in most parts of the course1-4 are assessed in the final research project report.

C. Practical skills – able to: 1 apply, or adapt, practical instructions safely <sup>–</sup> and accurately 2 carry out a variety of experimental procedures in the laboratory. 3 interpret quantitatively the results of experiments undertaken by themselves or others 4 devise experimental methods appropriate for tackling a particular problem	Teaching/learning methods and strategies   A range of detailed or outline practical instructions are used to allow students to develop a range of practical skills.   Staff and postgraduate demonstrators are present during practical sessions to guide and help, to mark their reports and give feedback on their work.   Students will work on their project under the guidance of one or more members of staff.   Assessment   1-4 are assessed to different extents by the practical work associated with the various modules undertaken.
D. Transferable skills – able to: 1 make use of IT (word processing, spreadsheets, web sources) 2 communicate scientific ideas 3 give oral presentations 4 work as part of a team 5 use library resources 6 manage time	Teaching/learning methods and strategiesThe use of IT is made throughout the programme.Team work is essential in the practical and role play sessions associated with modules PSMH1A, PSMH1B, PSMHB8, and FS 946.Library resources are addressed in all the modules and during the project work.Time management is essential for the timely and effective completion of the programme.Assessment 1-5 contribute to assessed coursework during the first two terms.

*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 expect 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 module and programme handbooks.

## Appendix

## Progression from Post-experience certificate to MSc course

Candidates admitted to a post-experience course who have followed the MSc programme during the autumn term may, at the discretion of the Head of School, transfer to the MSc programme if their performance in the December/January School examination is satisfactory (achievement of an average of 50%), the registration being back dated to the beginning of the Academic year.