

PROGRAMME SPECIFICATION

1	Teaching Institution(s)	University of Newcastle upon Tyne
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2	Programme Title	MRES BIOMOLECULAR SCIENCES
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3	Programme Aims:
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- i) to gain an advanced knowledge and understanding of biomolecular sciences.
- ii) to undertake a general training in research methods and management within biomolecular sciences. Within this aim, the students will be provided with individual experience of a range of cutting edge research within biomolecular sciences.
- iii) to develop a range of professional and key skills which will enable candidates to engage in teaching and/or research at an advanced level in higher education or in a senior professional capacity in other fields of employment.

4	Learning Outcomes:
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A	Subject Knowledge and understanding
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Knowledge and understanding of:

A1 self-selected key areas of molecular & cellular function and disease

B	Research skills, techniques and issues
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A detailed understanding of and ability to apply techniques for research and advanced academic study including:

B1 relevant biomedical and biomolecular experimental techniques

B2 statistical techniques relevant to medical research

B3 critical appraisal of research evidence

B4 ethical issues in research

B5 safety issues in research

C	Professional and key skills
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The acquisition of a range of professional and key skills including:

C1 communication of data

C2 oral presentations

C3 library and information technology skills

C4 business administration relevant to the biotechnology/pharmaceutical industries

5 Learning Outcomes, Teaching and Learning Strategies and Methods

A Subject knowledge and understanding

Acquisition of the basic knowledge (fundamental concepts, principles and practice) is achieved through a combination of lectures, seminars, demonstrations, practical classes and coursework. Students must be able to identify and solve problems, analyse and interpret data and reason critically. As the formal teaching is in essence small group teaching this facilitates discussion of key issues rather than a didactic approach. The students practice the application of concepts both orally and in writing and gain experience in the analysis and interpretation of laboratory data and published work. Students are expected to undertake independent reading to supplement and consolidate the material provided in lectures, seminars etc and to broaden their individual knowledge.

B Research skills, techniques and issues

Placements in research laboratories enable students to gain first hand experience of laboratory techniques and an understanding of how research programmes are designed, implemented, adjusted and managed. Students also benefit from working in a team during their laboratory projects which tests the ability to work collaboratively and develop time management skills.

Statistical techniques are taught in lectures which include practical exercises to test acquisition of techniques relevant to medical research. Small group teaching allows critical appraisal skills to be taught, discussed informally and assessed through case studies. Ethical and safety issues are taught via lectures, discussions and demonstrations.

C Professional and key skills

The rationale is to provide opportunities for 'hands-on' development of the skills within an explicit conceptual framework, underpinned by formative feedback. This element of the programme is intended to enable individual students to select and tailor learning experiences in accordance with their own professional/personal needs and may therefore vary from student to student. Teaching/learning methods include: workshops; formal training sessions; videoed exercises; groupwork; simulations; presentations; practical exercises and role-play.

6 Learning Outcomes and Assessment Strategies and Methods

A Subject knowledge and understanding

Assessment of the knowledge base is achieved through a combination of the unseen written examination, assessed coursework eg essays, practical write-ups, reports and oral presentations.

B Research skills, techniques and issues

The main strategy is to test acquisition of the necessary practical techniques/skills and conceptual understanding that underpins effective project design etc. This is achieved through a variety of methods including examinations, assignments, case studies, presentations, practicals, and statistical exercises. A group element may be present to test the ability to work collaboratively.

Laboratory projects are assessed by dissertation, oral examination and an assessment of effort/application. More detailed arrangements for assessment of Industrial Placements are as follows. The deputy DPD or DPD will make 2 visits to the location of the laboratory placement in order to monitor the student's progress. These visits will take place during the first third and at the end of the placement. On both occasions the deputy DPD or DPD will interview separately the student and placement supervisor. Student interview: previously agreed form of data that has been generated by the student will be discussed and assessed (see appendices 4 and 4a). Supervisor interview: there will be an opportunity to discuss the student's application/effort. Following the second interview, the deputy DPD or DPD will award an appropriate mark for the student's effort/application using the marking scheme (see appendix 5). In addition, both of the interviews will cover other issues such as safety and any social and practical problems encountered in the placement. On presentation of the final dissertation, the DPD (or deputy DPD) rather than the industrial supervisor, will award a final mark (subject to second marking by the deputy DPD) using the marking scheme (see appendix 6).

C Professional and key skills

The development of skills is assessed through presentations, computerised exercises and business plans.

7 Framework

The MRes will provide broad-based research training in contemporary biomolecular techniques. The MRes comprises 180 credits covering subject knowledge; research techniques; laboratory attachments; and professional/key skills.

<i>Component</i>	<i>Title</i>	<i>Credits</i>
Subject Knowledge <i>Three optional modules:</i> (all 15 credits)	Basic Mechanisms of Disease Cell Signalling Pathways Clinical Epidemiology Clinical Measurement Genetic Basis of Complex Disease Medical Imaging Proteomics, Genomics & Immunochemistry Scientific Basis of Neurological Disorders Transplantation Science	45

Research Techniques	Statistical Techniques in Medical Research	10
	Critical Appraisal	5
	Bioethics	5
	Safety	5
Project placements	Project placement 1	45
	Project placement 2	45
Professional/Key Skills	Library and Information Technology Skills	5
	Advanced Information Technology	5
	Communication & Presentation Skills	5
	Business for Biotechnologists	5
	Total credits	180

8 Learning Outcomes and Curricular

A Subject Knowledge and Understanding

Students are enabled to gain a knowledge and understanding of self-selected areas of molecular and cellular function and disease by studying three optional modules chosen from Basic Mechanisms of Disease, Cell Signalling Pathways, Clinical Epidemiology, Clinical Measurement, Genetic Basis of Complex Disease, Medical Imaging, Proteomics, Genomics & Immunochemistry, Scientific Basis of Neurological Disorders and Transplantation Science.

B Research Skills, Techniques and Issues

Students gain practical experience of relevant biomedical and biomolecular techniques through compulsory laboratory projects (in the University or industry), each lasting the equivalent of ten weeks. Statistical techniques and critical appraisal skills are taught in compulsory modules. Ethical and safety issues are imparted in compulsory modules.

C Professional and key Skills

Basic skills in how to communicate data and give an oral presentation are taught in a compulsory module. Information technology skills are taught in a compulsory module. Key skills in business administration relevant in the biotechnology and pharmaceutical industries are taught in a compulsory module.

9 Support for Students and their Learning

All students are registered in the Graduate School which has excellent infrastructure to support postgraduate students and their learning.

A Induction Programmes for New Research Students

The Graduate School organises an induction event which includes introductions to key figures and services in the Faculty and University, such as the Careers Service. This is followed by a reception which provides an early opportunity for students to interact socially. Candidates are provided with a Degree Programme Handbook detailing curricular assessment methods, degree regulations, and sources of help and support.

B Study Skills Support

Training in professional and key skills is an integral part of the programme.

C English Language Support

Students with a score of 5.5 to 6.0 are required to attend pre-sessional English classes. Students with a score between 6.0 and 6.5 are required to complete in-sessional language provision to reach 6.5 before the end of the programme.

D Academic Support

Candidates benefit from a strong team of academic support. The Graduate School is headed by the Dean of Postgraduate Studies and there is a Degree Programme Director and Deputy Degree Programme Director for the MRes. Module leaders and individual teachers provide academic support for the taught elements of the programme and placements.

E Pastoral Support

Students will be entitled to the full range of pastoral and personal support offered to postgraduate students which includes the University's Student Counselling Service, the Student Advice Centre and the Graduate School Office in the Faculty of Medical Sciences. At a Faculty level, pastoral support is provided by pastoral tutors, the Faculty Postgraduate Tutor and the Faculty Graduate School Administrator. Administrative and welfare support is provided by the Faculty Graduate School Office.

F Support for Special Needs

The University has a Disability Unit to which the attention of all students is drawn. The requirements of disabled students will be fully considered in the delivery of the degree programme and in its assessment processes. The University is also developing its service to mature students and to students who have childcare responsibilities. Hardship funds are available for both UK and international students.

G Learning resources

The University Library provides an excellent centrally-funded service for supporting student learning. It was the first university library to receive a Charter Mark for Excellence (1995, reviewed 1998). This is complemented in the Faculty by the Walton Library which holds 80,000 volumes, including around 900 current journal titles, and also provides work space and photocopying facilities.

The University Computing Service provides comprehensive computing facilities for all students at many open-access sites on campus, including provision for disabled access, with regular upgrades of equipment and software and management of student web accounts. There is remote access both on site and in halls of residence to the Library catalogue and other services. Some schools also maintain their own computing network, available for postgraduate student use.

In addition, the Cookson Computing Centre, based in the Faculty of Medical Sciences, has state of the art facilities with over a hundred machines in two PC and 1 Unix cluster. Newcastle is one of the 14 primary sites of the UK academic super JANET network which gives excellent connections to other networks including the Internet.

The Faculty has the equipment and facilities expected of an internationally competitive biomolecular and biomedical research institution. The following are available to all postgraduate research students:-

- Biomedical Microscopy Unit
- Biomedical Mass Spectrometry Unit
- Molecular Biology Unit and Proteomics

The University Careers Service advisers contribute to induction meetings, highlight the support and guidance available and help students to monitor the development of key skills. The Faculty has a dedicated careers officer who is always available for consultation and contributes to teaching on the programme.

There is also a Language Centre which provides pre-sessional and in-sessional programmes for students who need support with English for academic purposes.

10 Methods for Evaluating and Improving Quality and Standards

Module reviews: Annually through MRes Curriculum Committee.

Project placements: Continual monitoring by individual supervisors both in industry and the Faculty who will communicate with the Degree Programme Director at all stages via email. Quality control of the projects will be assessed at the midpoint of each rotation through a visit by the Degree Programme Director.

Programme reviews: Annually through MRes Curriculum Committee.

External examiner reports: Considered routinely by MRes Curriculum Committee and reported to Graduate School Committee and FTLC.

Student evaluations: conducted routinely and forms part of module review.

Feedback Mechanisms: Curriculum Committee; Staff/Student committee.

Faculty and University Review Mechanisms: Subject Review.

11 Criteria for Admission

A candidate may be entered for the degree provided that such a candidate has a minimum lower second class honours science degree, *or* has completed the fourth year of the Bachelor of Medicine and Bachelor of Surgery *or* Bachelor of Dental Surgery programme *or* the equivalent.

12 Regulation of Assessment

Pass marks: For all modules the pass mark is 50%. However, compensation will allow the possibility of passing the degree even if one module is failed, provided that the overall final degree mark obtained is over 50%, no single mark is below 40%, marks less than 50% are compensated in the assessment of modules with a total value of no more than 20 credits and no such compensation is permitted for core modules or the dissertation.

Marking schemes: These are held on file.

Role of external examiner: The external examiner is a distinguished member of the academic community appointed by FTLC. The role of the external examiner is approving examination questions, acting as a moderator, attending examination boards, and reporting to the University on comparability of standards.

16/2/04