

BSc Medical Microbiology
For students entering Part 1 in 2008/9

UCAS code: C521

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Biosciences
Faculty:	Life Sciences Faculty
Programme length:	3 years
Date of specification:	17/Aug/2010
Programme Director:	Dr Gail Hutchinson
Programme Advisor:	Dr Sheila MacIntyre
Board of Studies:	Biological Sciences
Accreditation:	None

Summary of programme aims

The programme in Medical Microbiology, which introduces students to the diverse array of microbes (bacteria, archaea, viruses, fungi and protozoa) around us, focuses on the properties of medically important bacteria and viruses and the interaction of these microbes with their host. The course aims to provide students with a fundamental background in the physiology, genetics and molecular biology of infectious microbes, complemented by basic aspects of mammalian immunology and cell biology as well as basic laboratory skills required for a career in either applied or research microbiology.

In Part 1 students will gain an understanding of the basic concepts of modern microbiology and also of the biochemistry, genetics and molecular biology that will support further studies. Part 2 deepens the students understanding of how viruses and bacteria survive, multiply and cause disease through core studies on their physiology, genetics and medical significance together with studies on mammalian immune system and cell biology. Part 3 covers in depth studies of selected aspects of bacterial and viral pathogens and aims to bring the students' understanding to the fore-front of selected areas of microbiology research, through lectures, directed studies and presentations as well as a lab-based project.

During these studies students will be exposed to a variety of information sources and techniques and be trained in various skills including those used in reasoning, argument and communication. Students will acquire a number of transferable skills including learning how to design and execute experiments (including working in a team), access information, interpret data using statistics and computing, write essays and reports and give oral and poster presentations.

Transferable skills

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills in line with the University's Strategy for Learning and Teaching. In following this programme, students will have had the opportunity to develop such skills, in particular relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working in the laboratory and use of information technology and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum. Students will also gain experience in the methodology of research and scholarship.

Programme content

The profile which follows states which modules must be taken (the compulsory part), together with optional modules thought to be most appropriate for Medical Microbiologists. Students must choose modules offered by SBS, School of Chemistry, Food Biosciences and Pharmacy or other University of Reading Schools and Departments, subject to the agreement of the Programme Adviser, to a total of 120 credits in each Level.

Part 1 (three terms)

Compulsory modules

<i>Module</i>	<i>Title</i>	<i>Credits</i>	<i>Level</i>
BI1BA12	The Living Cell	20	C
BI1BB2	Biochemistry and Metabolism	10	C
BI1BC2	Genes and Chromosomes	10	C
BI1BD1	Introductory Microbiology	10	C

BI1BF1	Laboratory and Study Skills for Biomedicine	10	C
BI1BG3	Practical Biochemistry	10	C
BI1EC1	Exploiters and Exploited	10	C
PM1PB2	Human Physiology	20	C

Also, students without AS Chemistry or an equivalent qualification must take:

CH1FC1	Fundamental Concepts in Chemistry 1	10	C
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Optional modules (10 or 20 credits). To achieve a total of 120 credits, students will choose further modules, subject to approval by the Programme Adviser. Suggested modules include:

AP1A18	Digestion and Nutrition	10	C
BI1BE2	Pathology: Introduction to Human Disease	10	C
BI1EC12	*Exploiters and Exploited (as 20 credit module)	10	C
BI1EG1	Plant Diversity, Structure and Utilisation	10	C
FB1MB1	Introduction to Food Microbiology	10	C

Students taking CH1FC1, or who have AS Chemistry but not A2 level Chemistry may take:

CH1FC2	Fundamental Concepts in Chemistry 2	10	C
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Part 2 (three terms)

Compulsory modules

Module	Title	Credits	Level
AS2A1	Statistics for Life Sciences	10	I
BI2BD4	Life and Death of a Cell	10	I
BI2BF4	Physiology and Genetics of the Bacterial Cell	10	I
BI2BI5	Immunology	10	I
BI2BJ5	Microbiology: A Medical Perspective	10	I
BI2BK5	Molecular Biology of the Gene: Expression, Function and Analysis	10	I
BI2BM5	Science Communication	10	I
BI2BO4	Virology	10	I
BI2BP6	Practical Skills: Recombinant DNA Exercise	10	I
FB2MF2	Microbiological Hazards in Foods	10	I

Recommended Modules (10 credits)

BI2BL5	Protein Structure and Function	10	I
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Optional modules (10 or 20 credits). To achieve a total of 120 credits, students will choose further modules, subject to the agreement of the Programme Adviser. Suggested modules are:

BI2BB4	Endocrinology	10	I
BI2BE4	Pharmacology and Toxicology	10	I
BI2BG5	Animal, Plant and Microbial Development	10	I
BI2BQ5	Clinical Haematology and Cellular Pathology	10	I
BI2EE4	Evolutionary Biology	10	I
BI2EH4	Introduction to History and Philosophy of Science	10	I
ES2F4	Soil Ecology and Function	10	I
FB2BPP	Protein Purification and Proteomics	10	I

Part 3 (three terms)

Compulsory modules

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
BI3BC7	Bacterial Pathogens	10	H
BI3BJ8	Viral Pathogens	10	H
BI3BG8	Mechanisms for Microbial Function	10	H
BI3PRO	Research Project	40	H

Students will choose a further 50 credits subject to the agreement of the Programme Adviser. Suitable choices would include:

Recommended module (up to 20 credits)

BI3BM8	Immunology of the Bacterial, Viral and Parasitic Disease <i>a c</i>	10	H
BI3BN8	Use and Abuse of the Microbial World <i>a b</i>	10	H

Optional modules (up to 50 credits)

AS3A1	Epidemiology	10	H
AS3A2	Clinical Trials	10	H
AS3B1	Genetic Data Analysis	10	H
BI3BA7	Medical Genetics	10	H
BI3BB7	Selected Topics in Endocrinology and Endocrine Disease	10	H
BI3BD8	Cancer	10	H
BI3BE8	Cardiovascular Disease	10	H
BI3BF7	Cell Communication and Disease <i>a</i>	10	H
BI3BI8	Neurobiology	10	H
ES3F8	Applied and Environmental Microbiology <i>b</i>	10	H
FB3N3	Bioavailability, Diet and Gut Health <i>a b c</i>	10	H

a Recommended for students with an interest in Molecular and Medical Microbiology

b Recommended for students with an interest in Environmental Microbiology. NB: Students who were not been able to attend the pre-requisite, ES2F4, because of timetable restrictions, should contact Dr E Shaw, (Soil Science) about taking ES2F4 as a Part 3 module.

c Recommended for students with and interest in Clinical or Food Microbiology

Progression requirements

To gain a threshold performance at Part 1 a student shall normally be required to achieve an overall average of 40% over 120 credits taken at 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.

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 at 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.

Degree classification will normally be based on the marks for Part 2 and Part 3 modules, weighted in a ratio of 1:2. Full details of classification conventions (that is, the rules for determining your final degree award) can be found in the Undergraduate Handbook.

Summary of teaching and assessment

Teaching is organised in modules. Teaching in Part 1 consists of lectures and practical classes with small group work being largely restricted to some aspects of practical classes or study sessions. Modules can be assessed by 100% coursework but more usually are assessed by a combination of coursework (30%) and formal examination (70%).

In Parts 2 and 3, lectures and practical classes continue to be major modes of teaching but they are increasingly supplemented by seminars and other group work. Modules can be 100% in-course assessed but are more usually assessed by a combination of coursework (30%) and formal examination (70%).

The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks.

Admission requirements

Entrants to this programme are normally required to have obtained:

UCAS Tariff: 280 points from no more than 4 subjects at A level, including 2 full A levels. Subjects to include grade C in A level Biology and another A level Science, Chemistry preferred. Total points exclude Key Skills and General Studies. **GCSEs:** grade C required in Mathematics, English and Science.

International Baccalaureate: Pass Diploma and achieve 6,5,5 in 3 higher level subjects, including Biology and another Science, preferably Chemistry.

Applicants with other types of qualifications and mature students are also encouraged to apply

Admissions Tutor: Dr Robert Jackson

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 Personal Tutors, School Senior Tutors, the Students' Union, the Medical Practice and the Student Services Directorate. The Student Services Directorate is housed in the Carrington Building and includes the Careers Advisory Service, the Disability Advisory Service, Accommodation Advisory Team, Student Financial Support, Counselling and Study Advisors. Student Services has a Helpdesk available for enquiries made in person or online (www.risisweb.reading.ac.uk), or by calling the central enquiry number on (0118) 378 5555. 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 on everything from accommodation to finance. The Carrington Building is open between 8:30 and 17:30 Monday to Thursday (17:00 Friday and during vacation periods). Further information can be found in the Student website (www.reading.ac.uk/student).

The Programme Adviser is available to offer advice on the choice of modules within the degree course.

Career prospects

Reading Microbiology graduates are qualified to enter a variety of careers in academia, industry and public health bodies. Many of our students continue in a research career or find employment in universities, the Health Protection Agency, Environment Agency or in Research Institutes, others have found positions in Industry (Pharmaceutical, Biomedical, Agrochemical or local water authorities). Some graduates continue their training, for example in medicine, forensic science or the teaching profession. As scientists with developed numeracy and communication skills, our graduates also have qualifications suited to a wide variety of occupations in commerce, business and scientific journalism. Honours graduates will be eligible for membership of the Institute of Biology and Chartered Biologist status.

Opportunities for study abroad or for placements

Industrial Placement:

Students who are interested in a scientific career, whether in industry, research or some other related field can apply for a year's placement between Parts 2 and 3. Students who wish to apply would normally be expected to have a weighted average of at least 60% in Part 1.

Study Abroad:

The Erasmus programme (within Socrates) enables undergraduates to undertake project work for one term in their final year at one of a number of European Universities. Recent exchanges involving School of Biological Science students have taken place with the following: University of Tours, France; Odense University, Denmark; Uppsala University, Sweden; University College Cork, Ireland; University of Zaragoza, Spain;

ENSA, Montpellier, France; University of Cagliari, Sardinia. Students also have the opportunity to go to Rostock University, Germany and Siena University, Italy.

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:

1. The fundamental concepts of microbiology, such as the classification, identification and laboratory manipulation of microbes.
2. Core principles of bacterial and viral structure, physiology and genetics.
3. Details of their interactions with mammalian host at the molecular level, underpinned by a knowledge of other branches of immunology, molecular and cell biology.
4. Principles of prevention and treatment of microbial diseases

Teaching/learning methods and strategies

Formal lectures and practicals supported by tutorials in specific areas related to microbiology (in Part 2), group work and miniprojects.

Assessment

Most knowledge is tested through a combination of coursework and unseen formal examinations. Dissertations, oral and poster presentations also contribute.

Skills and other attributes

B. Intellectual skills - able to:

1. Think logically
2. Analyse and solve problems.
3. Organise tasks in a structured form
4. Transfer appropriate knowledge and methods from one topic to another within the overall subject
5. Plan, conduct and write a report on an independent project
6. The ability to formulate and test hypotheses.

Teaching/learning methods and strategies

Rational thought and logical analysis is developed throughout the programme, building to an ability to deduce how solutions to key problems in biology are derived through the application of experimental procedure.

Assessment

A mixture of written examinations, and continuous assessments such practical write ups, essays and poster and oral presentations.

C. Practical skills - able to:

1. Undertake microbiological and biochemical laboratory tasks and techniques
2. Plan experiments and carry them out in the laboratory

Teaching/learning methods and strategies

Formal practical classes, project in Part 3 in an area of microbiology

Assessment

By practical laboratory reports.

D. Transferable skills - able to:

1. Use IT
2. Communicate scientific ideas
3. Give oral and poster presentations
4. Work as part of a team
5. Use library resources
6. Manage time
7. Plan their career

Teaching/learning methods and strategies

The use of IT is embedded throughout the course.

Assessment

The skills will enhance the performance of students in both coursework and unseen examinations.

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.