Programmes in Biomedical Sciences
EMS: Biomedical Sciences
University of Edinburgh

Senior Honours Guide
2021-22

Produced by
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http://www.ed.ac.uk/biomedical-sciences/bmto

STAFF WHO WILL BE HAPPY TO HELP YOU WITH YOUR ENQUIRIES

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DISCLAIMER

Every effort has been made to ensure the contents of this booklet are accurate at the time of printing. Unforeseen circumstances may, however, necessitate changes to the procedures, curricula and syllabuses described. The Biomedical Teaching Organisation (BMTO) undertakes to operate within the rules and regulations as set out in the University of Edinburgh *"Degree Regulations and Programmes of Study"* and the Examination Regulations. It will also honour undertakings made in writing to individual classes, insofar as these do not conflict with the University's regulations. The contents of this handbook are for the session year stipulated. The University may make changes to the course/programme for future sessions.

Course availability will be subject to student numbers. Students should check course details for timetabling information and location as courses are taught at a number of sites across the University.

If you require this document or any of the internal University of Edinburgh online resources mentioned in this document in an alternative format please contact BMTO bmto@ed.ac.uk, 0131 650 3160

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STRUCTURE OF THE HONOURS YEAR

All years of undergraduate degree programmes in the University consist of 120 credit points made up from separate courses, in units of 10, 20 or 40 credit points. To conform to these regulations and to ensure uniformity across programmes the Board of Studies in Biomedical Sciences decided to adopt a common structure for the Senior Honours year in Biomedical Sciences degrees. The common structure has the following features:

Whole Year (Semesters 1 and 2)

20 credit points, 1 x 20 credit point ***compulsory*** course:

This is a course taken by everyone doing a particular programme that introduces and develops "core", programme-specific, material and skills.

Semester 1

40 credit points, normally 2 x 20 credit point courses:

These are student-selected ***elective*** courses. Guidance is provided through programme-specific lists of recommended and suitable courses. All assessments are completed within Semester 1 and may include 100% exam, 100% ICA or a combination of exam and ICA.

Semester 2

1 x 40 credit point research project.

The assessment of the research project will comprise a project report (87.5%) and oral presentation (12.5%). Group projects carried out within the Biomedical Sciences programme have a modification of this assessment structure – see p9 for details.

20 credit points, 2 x 10 credit point courses.

A synoptic examination and a project-related course.

The details of the courses you are required to take and possible elective courses are set out in this guide.

The degree classification awarded will be based on the marks obtain in the Junior and Senior Honours years at the ratio of 1:2. For students who have spent the Junior Honours year abroad degree classification is based on the Senior Honours year only.

CRITERIA FOR ADMISSION TO THE SENIOR HONOURS YEAR

In order to proceed to the fourth, Senior Honours, year you must previously have obtained at least 360 credit points and met the requirements set out in the DRPS which include,

- passes in all core 1st and 2nd year Biomedical Sciences courses. [Core courses are listed in the Biomedical Sciences Degree Programme Tables http://www.drps.ed.ac.uk/21-22/dpt/drps_bms.htm] Note DRPS entry for 21-22 will not be live until 22 April 2021. Prior to this date please review Degree Programme Tables for 21-22: (http://www.drps.ed.ac.uk/20-21/dpt/cx_s_su722.htm) but note there may be changes in course content or assessment for 2021-22.
- a pass in the core 3rd year course designated by the programme of study
- at least 80 credit points obtained by passing level 9 or level 10 courses in the Junior Honours year.
- an overall weighted average mark of at least 40% in 120 credit points* of level 9/10 courses taken in the Junior Honours year. * Only 120 credit points of level 9/10 courses can be taken in the third Junior Honours year, equally balanced across semester 1 and semester 2.

REQUIREMENTS FOR GRADUATING WITH A BSC. BIOMEDICAL SCIENCES DEGREE

In the fourth, Senior Honours, year all compulsory courses must be taken, but passing these courses is not a requirement for award of an Honours degree in the specific discipline (although clearly a fail mark will impact on your overall mark and, therefore, the final degree classification).

You must have obtained 480 credit points over the degree programme to graduate with Honours. No exceptions can be made to this rule, although up to 40 credit points can be awarded for failed courses in each of the Honours years by a process called "aggregation". Credit points will be awarded by aggregation as long as your overall weighted average mark for 120 credit points of courses taken in each of the Honours years is at least 40%.

PRE-REGISTRATION FOR COMPULSORY AND ELECTIVE COURSES

All Biomedical Sciences students entering the Senior Honours year will be automatically registered for the relevant compulsory courses. However, it is necessary for all students to submit their choices for elective courses. This guide explains the structure of the final year programme and the decisions that have to be made for the elective courses. An electronic form to indicate your course choices will be available on Learn. You must complete this form and submit it by **Monday 26 April 2021**.

Students who do not return their choice forms by the required date may miss out on the initial allocation of elective courses and will, therefore, have less chance of getting their desired courses.

In the Senior Honours year, the Honours Programme Organiser has a responsibility for approving a student's academic programme. This is because the Programme Organiser is a specialist in the degree subject and is best placed to advise the student. Your Personal Tutor is also an important source of advice and guidance in curricular matters and should be consulted when considering elective course choices. Students who wish to deviate from the standard programme are advised to discuss this with the Programme Organiser.

Students will be informed during the summer vacation, through the Programme Organiser, as to which elective courses they have been admitted.

ADVICE ON CHOOSING ELECTIVE COURSES

The Senior Honours year is an opportunity for in-depth study within a particular degree programme and it is essential for your studies to be suitably focussed on your degree subject area. The section of the guide dealing with your honours programme explains the choices open to you. The advice in these sections varies from programme to programme; it has been specifically tailored to the subject areas.

After a general introduction to the year the compulsory courses are listed and you are told how you must choose your two elective courses to make up the 120 credit points for the year. *Please note the instructions carefully; most programmes require you to select at least 20 credits from List 1.* Each programme can have a List 1 and List 2. List 1 contains courses which are *recommended* for your programme, and List 2 contains courses also judged to be *suitable* for your programme. Full descriptions of these courses can be found through the hyperlinks provided at the back of this guide in appendix I (page 35). Please note that the URLs listed are for the 2021-22 academic year and will not be accessible until 22 April 2021. You can view course descriptions through the 2020-21 Degree Regulations & Programme of Studies, but please be aware that there may be changes in course content or assessment for 2021-22: http://www.drps.ed.ac.uk/20-21/dpt/cx_s_su722.htm

How Elective Courses Will Be Allocated

It is appreciated that Senior Honours teaching and learning is much more effective in smaller, rather than larger, classes. We also know that students look forward to smaller classes in their final year after being in large classes in the previous years. For these reasons the maximum class size for Senior Honours elective courses in this guide is commonly 25 though in some cases this may be increased or decreased after consultation with the Course Organiser and the BMTO.

Your allocation to courses is overseen by the Director of Teaching in the Deanery of Biomedical Sciences. In an ideal world all students would get their top or other high choices but because demand will be uneven this will not always happen. Allocation to elective courses will attempt to arrive at the "best" overall fit. In the event of you choosing a course that is oversubscribed, your allocation will be guided by the following criteria.

1. Preference will be given to students enrolled on undergraduate degree programmes administered by the Biomedical Teaching Organisation.
2. Whether the elective course is on the lists of recommended (*List 1*) and suitable (*List 2*) courses for your degree programme.
3. The ranking you have given to the elective on your choice form.
4. Availability of places on other chosen courses and where these rank in your choice form.

A key aim will be to arrive at the 'best' overall solution taking account of the available information. The Board of Studies has agreed that if too few students wish to take a course it may be withdrawn.

You will not be allocated to courses that have overlapping timetable slots.

Changing your mind with elective courses

Unlike in the earlier years changing your chosen elective courses once allocation is complete is not possible. The limited number of places available on each elective course and competition for places means that making a change is often not possible because courses are full. **It is, therefore, important that you carefully consider your elective choices as once submitted they will be binding and no changes can be made after the deadline of 26 April.**

Choosing elective courses from outside the Biomedical Sciences portfolio

Some programmes allow students to choose up to 20 credits of elective courses from beyond those specified in List 1 and List 2. You will not, however, be permitted to enrol on an elective course that has any timetable clash with your compulsory courses or elective course allocated from List 1.

Changing Honours Programme

At the end of second year all students were admitted to a specific Honours Programme. Most students will have taken courses in third year that would qualify them for the final year in another discipline. Any student who wishes to apply to transfer to a different Honours Programme within Biomedical Sciences should complete an Honours Transfer Form: https://edin.ac/3rRDCdD. The deadline for submitting the Honours Transfer Form is **Monday 29 March 2021**. Students wishing to transfer to a programme in another School should contact the other School directly.

For students who wish to enter into a different Honours programme* within Biomedical Sciences it is expected that the transfer will be approved if you have passed the core course associated

with the programme in question and met the other progression criteria (see http://www.drps.ed.ac.uk/21-22/dpt/drps_bms.htm). Where a student has requested a programme transfer, you should select your Year 4 elective courses based on the programme that you are requesting to transfer into. You should follow the guidance given in the Pre-Registration handbook as to suitable elective courses.

HONOURS PROJECT ALLOCATION

Contact: Kevin McArthur BMSProjectPortal@ed.ac.uk

Biomedical Sciences Honours
Students on the Biomedical Sciences Honours programme will be allocated into groups in the second half of Semester 1. Each group will be allocated a supervisor but the topic will be a group decision. Students on the Biomedical Sciences Honours programme who wish to do an individual project should discuss this with the Honours Programme Organiser.

All other Programmes
All other programmes use the Honours Project Portal.

Details for honours projects are gathered over the summer and entered into the Honours Project Portal. To allow you more time to research the projects, and have more time to consider your interests before getting access to the Portal itself in September, you will be given access to some of the project details noted as suitable for your programme from around mid-July. Although you maybe able to tell who the project supervisors are, no contact details will be provided and you are asked not to contact supervisors at this time. The Portal is launched to students in September and students have 2-3 weeks to take a look at projects and, if required, meet with supervisors. Students are then asked to rank their top five projects and confirm these choices in the portal in early October. Students are allocated to projects using an algorithm, and the Project Portal Team meet in mid-October to look at the allocations. After this meeting students are informed whether they have been allocated in Round 1 or if they need to go into Round 2. The Portal is then reopened for Round 2, following the same process as Round 1. Once Round 2 choices are made, the Portal Team meets again to confirm Round 2 allocations. Once all students are allocated, usually in early November, students and supervisors are contacted to confirm the allocations.

Academic staff in Biomedical Sciences and across the wider Edinburgh Medical School community are asked to provide projects. We have four types of honours project:

- Laboratory-based (The defining feature of this project type is that the student **generates and analyses their own primary data**. Projects that are not lab-based but generate primary data e.g. clinically-related data, also fall into this category)
- Analysis (student undertakes critical review and/or data/meta-analysis of existing data)
- Group (4 students working to produce a dissertation together)
- Qualitative

It is worth noting that only students on certain programmes can do Group projects.

It is also possible for students to find their own project. These projects are dealt with outside the Honours Project Portal and they must be approved by your Honours Programme Organiser.

Full details on the Honours Projects, the Portal and deadlines will be provided once you start your programme in September.

ANATOMY AND DEVELOPMENT

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The fields of Anatomy and Developmental Biology are closely interlinked. Knowledge of Anatomy is important in many areas of Biology and Medicine, including Developmental Biology. Similarly, Developmental Biology tells us much about how normal Anatomy is formed and maintained. Understanding the Anatomy and Development of tissues and organs is essential to the emerging area of tissue repair. The Anatomy and Development honours programme is open to both Biomedical Sciences and MBChB students, giving them an opportunity to gain specialist knowledge and skills that will enhance their future careers in research, clinical medicine or other areas. Edinburgh Medical School has a long-established reputation for excellence in biomedical research and teaching. Academic staff involved in cutting-edge biomedical research programmes rated as internationally excellent or world leading, bring a breadth and depth of research-based knowledge and expertise to their teaching and supervision, providing an outstanding student learning environment that fosters individual intellectual development in the study of Anatomy and Developmental Biology.

Programme structure (outline)
The senior honours programme follows the standard biomedical sciences model. Briefly:

Semester 1
- A compulsory Anatomy & Development Core course (Wednesday mornings)
- Two taught elective courses.

Semester 2
- Continuation of core course (weeks 1-5 only)
- An 11-week research project. Projects may be lab based, or involve data analysis. Projects include preparation of a dissertation and an oral presentation.

a) You must do the following compulsory courses

		Points
BIME10044	Anatomy and Development Core	20
BIME10043	Anatomy and Development Grant Proposal	10
BIME10042	Anatomy and Development Project	40
BIME10041	Anatomy and Development Synoptic Exam	10
	Points	**80**

(b) In addition you must take 2 level 10 courses. One is required from List 1*, the second elective can be from List 1 or 2 (see appendix I).
*It is strongly recommended that students select either Anatomy of the Head and Neck or Anatomy of the Limb.

Total points 120

Compulsory Courses in the Anatomy and Development Honours Degree Programme

Code	Course Name	Prog	Sem	Time Slot
BIME10044	Anatomy and Development Core	AD	1	Wed am
Description: The aims of this course are to introduce students to the broader concepts in Anatomy & Developmental Biology research and to provide them with the key set of core competencies that they will require for successful completion of the Anatomy and Development honours programme. A series of research highlights lectures will present a wide range of current research topics in Anatomy & Developmental Biology, including contributions from clinicians. Students will learn how to critically evaluate scientific research and to present their findings to both expert and lay audiences. Students will learn how to formulate hypotheses and how to design and present research projects to test them.				
BIME10043	Anatomy and Development Grant Proposal	AD	2	
Description: Students will be expected to formulate hypotheses linked to a specific subject area, design a series of experiments to test these hypotheses, and produce a Grant Proposal - a mock application for funding in which the student describes the research problem, its importance, the hypotheses, and the experiments they would propose to perform. Guidance will be given on this process in Semester 2. Dependent upon class size, students may carry out this task in groups of up to 4, rather than individually.				
BIME10042	Anatomy and Development Project	AD	2	
Description: All students will carry out a research project in Semester 2. Projects will be supervised by members of University academic staff. Students will select their project topic either from the list of titles offered using the BMS portal system; or, if you wish to pursue a special topic that interests you for a project, you yourself				
BIME10041	Anatomy and Development Synoptic Exam	AD	2	
Description: The Synoptic exam is an opportunity for students to demonstrate their broad knowledge of Anatomy & Development as obtained throughout their honours year, to show both originality of thought and breadth of knowledge. In the exam, students will write an essay based on one of several broad essay titles. Students will be expected to synthesise knowledge from across their learning experience, to craft their thoughts into a coherent structure and argument, and to support their argument with evidence from research in the fields of Anatomy and / or Developmental Biology.				

List 1 Anatomy and Development		
Course Code	Course Name	Teaching Time
BIME10048	Anatomy of the Head and neck	Thurs/Fri am
BIME10045	Anatomy of the Limbs	Thurs/Fri pm
BIME10046	Applied Human Osteology	Mon/Tues am
BIME10028	Conception to Parturition	Thurs/Fri am
BIME10027	Development and Disease	Mon/Tues am
BIME10026	Developmental and Clinical Neuroscience	Mon/Tues pm
BIME10017	Regenerative Medicine	Mon/Tues am
BIME10047	Sex Determination	Mon/Tues pm
List 2 Anatomy and Development		
Course Code	Course Name	Teaching Time
BIME10030	Cancer Biology and Medicine	Mon/Tues am

BIME10029	Cardiovascular Pharmacology & Therapeutics	Thurs/Fri all day
BIME10024	Endocrine Physiology & Pharmacology	Thurs/Fri am
BIME10023	Forensic Investigation	Mon/Tues pm
BIME10074	Gametes and Gonads	Mon/Tues am
BIME10022	Genetic and Environmental Influences on Behaviour and Mental Health	Mon/Tues pm
BIME10020	Hormones and Behaviour	Thurs/Fri am
BIME10073	Human Genetics and Molecular Medicine	Thurs/Fri am
BIME10036	Inflammation and Tissue Repair	Thurs/Fri pm
BIME10011	Neural Circuits in Learning and Memory	Mon/Tues am
BIME10070	Neurobiology of Cognition in Health and Disease	Mon/Tues pm
BIME10009	Neuroimaging	Mon/Tues pm
BIME10032	Neurodegeneration, Obesity and Cancer	Thurs/Fri am
BIME10008	Neurotransmitters in Action	Thurs/Fri pm
BIME10037	Reproductive Cancers	Mon/Tues pm
BIME10015	Science Communication	Mon/Tues pm
BIME10055	Scientific Frontiers of Medicine	Mon/Tues am
BIME10014	Sensory Physiology and Dysfunction	Mon/Tues am

See appendix I on page 33 for full course details.

BIOMEDICAL SCIENCES

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The theme of the Biomedical Sciences Honours Programme is the study of the scientific basis of human medicine and healthcare. This embraces diseases and disorders important nationally and internationally, including their identification and the role of biological science in advancing understanding and laying the foundation for their rational management and treatment; implementation of drug design and discovery; integration of new technologies, including genomics and cell therapy; international health; resources; and ethical and socio-economic factors.

This programme, introduced in response to student demand, aims to inspire/encourage a new generation of innovative researchers, communicators, educators and managers. The Programme has a number of distinctive features: an interdisciplinary approach, as well as an emphasis on group-work with literature and/or data analysis and the development of communication skills.

The compulsory Biomedical Sciences Core course (worth 20 credit points) runs throughout the year. In semester 1 it comprises lectures and seminars by experts in various aspects of the subject and student presentations based on recently published papers. Topics covered vary from year to year, but broadly cover disease and medicine in society; how biology impacts on medicine; how advances can be used to prevent and treat disease; international health; ethical and socio-economic factors. In Semester 2 the Core course focuses on development of skills in critical analysis of papers, statistical analysis, and communication. Students also choose a total of two elective (20 credit point) courses.

Project, semester 2: Students undertaking group literature- and/or data analysis-based projects work in a team of usually 3-4 students (with a team supervisor), producing a group report (dissertation) on a disease/disorder that has important social, economic and medical significance. Recent dissertations have been on, for example, obesity, health screening programmes, pre-natal health, autism, health impacts of urbanisation, and organ transplants. Students undertaking individual laboratory-based or analysis-based research projects (arranged through the Honours Project Portal) will have an individual supervisor.

Graduates from the programme have gone on to pursue a highly diverse set of careers both within the biomedical and healthcare fields and outwith them as well.

(a) You must do the following compulsory courses

			Points
BIME10002	Biomedical Sciences Project		40
BIME10038	Biomedical Sciences Core		20
BIME10039	Critical Analysis Skills in Biomedical Sciences		10
BIME10040	Biomedical Sciences Synoptic Examination		10
		Points	**80**

(b) In addition you must take 2 level 10 courses from List 1 (see appendix I).
Total points **120**

Compulsory Courses for the Biomedical Sciences Honours Degree Programme

Code	Course Name	Prog	Sem	Time Slot
BIME10002	**Biomedical Sciences Project**	BMS	2	None
Description: Some students will do group library projects based on an important topic in the general area of biomedical sciences. Students will have considerable freedom to follow up their own ideas and to decide with project supervisors the exact content of the project. A typical project				

will focus on a disease/disorder/health topic that has important social, economic and medical significance. Assessment will mainly be based on a set of deliverables that will include a dissertation report, oral presentations, a project plan, and a lay communications assignment. A typical report will include 3-4 specialised chapters (1 chapter per student, assessed individually) together with a general introduction and an integrated discussion. While each student will be responsible for a chapter, the final project report will be the communal work of the group and thus involve team writing and editing. A small element of peer assessment will be included in the marking scheme. One purpose of these group projects is for students to learn teamwork, and part of the assessment will be based on the minutes of structured weekly management meetings that the team will hold. There will thus be a preparatory teaching session for all students on project planning and teamworking. Alternatively, there are opportunities for students who wish to do an individual laboratory-based or analysis-based research project, through the Honours Project Portal, in which case their Dissertation is worth 87.5% and their Final Talk is worth 12.5% of the final Project mark. This course is only available to students on the Biomedical Sciences Programme.

Group Project Marking Scheme:

Deliverables	**% of final Project mark**
Group	
Project plan	No marks
Dissertation - group elements: Professional Summary, Group Introduction, Discussion & Conclusions	24
Lay communications element	8.5
Management portfolio	5
Group Total *	**37.5%**
Individual	
Individual chapter	50
Final talk	12.5
Individual Total	**62.5%**
OVERALL	**100%**

Code	**Course Name**	**Prog**	**Sem**	**Time Slot**
BIME10038	**Biomedical Sciences Core**	BMS	1&2	Wed am

Description: The course addresses the theme of the Biomedical Sciences Hons BSc Programme, namely the scientific basis of human medicine. Through lectures from experts in the field and student led presentations we will explore: diseases and disorders important nationally and internationally, including their identification and the role of biological science in advancing understanding and laying the foundation for their raional management and treatment; implementation of drug design and discovery; integration of new technologies, including genomics and stem cell techniques; international health; resources; ethical and socio-economic factors. The course also aims to provide familiarity with statistical techniques commonly-used in the biomedical literature, and with the principles of designing and conducting clinical trials.
Development of communication skills will be through student-led sessions discussing and critically evaluating recent papers. Teaching methods: Lectures, seminars and student-led presentations. The Core course has two components of formal assessment: an exam at the end of semester 1 on the topics covered during that semester, and an in-course essay assignment in semester 2.
This course is only available to students on the Biomedical Sciences Programme.

BIME10039	**Critical Analysis Skills in Biomedical Sciences**	BMS	2	
Critical evaluation of published primary research articles, and skill in clear and accurate scientific communication are two explicitly identified learning objectives of the Biomedical Sciences Honours BSc Programme. These will be assessed through a Critical Analysis Task in which students will demonstrate their ability to interrogate research papers in depth by critically evaluating an original published research paper (i.e. not a review) relating to the topic of their Project. To ensure that appropriate papers are chosen, each student is initially required to select two potential papers and to send these to their project supervisor, who will then decide which of these two papers should be used (to prevent selection of an inappropriate paper – eg because it is far too complex, or because it is too trivial, lacks data, etc). Each student will provide an independent report (1500 words max.) of that published paper for assessment, according to a specified format. This report will form 100% of assessment for this course. Critical evaluation of papers depends in part on being able to understand enough of statistical techniques to make a reasonable judgement about what conclusions may be legitimately drawn from data. Teaching sessions on statistics/data analysis will therefore be held to help develop/consolidate understanding of these issues. A tutorial session will focus on how to construct a balanced evaluation of a specific example paper. Teaching methods: Lectures, tutorial/seminars. This course is only available to students on the Biomedical Sciences Programme.				
BIME10040	**Biomedical Sciences Synoptic Examination**	BMS	2	
The synoptic examination gives students the opportunity to display what they have gained from the Biomedical Sciences Honours BSc Programme as a whole by demonstrating their ability to integrate knowledge and understanding obtained from different elements of the Programme. Students will be asked to write an essay that draws on different areas of their knowledge and understanding obtained from any or all of the courses that they have taken. The essay will be marked for style, clarity and fluency and for logical structure and evidence of critical thinking. Credit will be given for the appropriate use of good examples to support or explain particular points and extra credit will be given where examples are drawn from diverse aspects of the Programme. This course is only available to students on the Biomedical Sciences Programme.				

List 1 Biomedical Sciences		
Course Code	Course Name	Teaching Time
BIME10048	Anatomy of the Head and neck	Thurs/Fri am
BIME10045	Anatomy of the Limbs	Thurs/Fri pm
BIME10035	Antibiotic Crisis	Thurs/Fri pm
BIME10046	Applied Human Osteology	Mon/ Tues am
BIME10030	Cancer Biology and Medicine	Mon/ Tues am
BIME10029	Cardiovascular Pharmacology & Therapeutics	Thurs all day/Fri am
BIME10028	Conception to Parturition	Thurs/Fri am
BIME10027	Development and Disease	Mon/ Tues am
BIME10026	Developmental and Clinical Neuroscience	Mon/ Tues pm
BIME10025	Diagnostics and therapeutics for infectious disease	Thurs/Fri am
BIME10024	Endocrine Physiology and Pharmacology	Thurs/Fri am
BIME10023	Forensic Investigation	Mon/ Tues pm

BIME10074	Gametes and Gonads	Mon/ Tues am
BIME10022	Genetic and Environmental Influences on Behaviour and Mental Health	Mon/ Tues pm
BIME10021	Global Health and Infectious Diseases	Mon/ Tues am
BIME10020	Hormones & Behaviour	Thurs/Fri am
BIME10073	Human Genetics and Molecular Medicine	Thurs/Fri am
BIME10036	Inflammation and Tissue Repair	Thurs/Fri pm
BIME10011	Neural circuits for learning and memory	Mon/ Tues am
BIME10070	Neurobiology of Cognition in Health and Disease	Mon/ Tues pm
BIME10032	Neurodegeneration, obesity and cancer: genetics and beyond	Thurs/Fri am
BIME10009	Neuroimaging	Mon/ Tues pm
BIME10008	Neurotransmitters In Action	Thurs/Fri pm
BIME10017	Regenerative Medicine	Mon/ Tues am
BIME10037	Reproductive Cancers	Mon/ Tues pm
BIME10015	Science Communication	Mon/ Tues pm
BIME10014	Sensory Physiology and Dysfunction	Mon/ Tues am
BIME10047	Sex Determination	Mon/Tues pm

See appendix I on page 33 for full course details.

INFECTIOUS DISEASES

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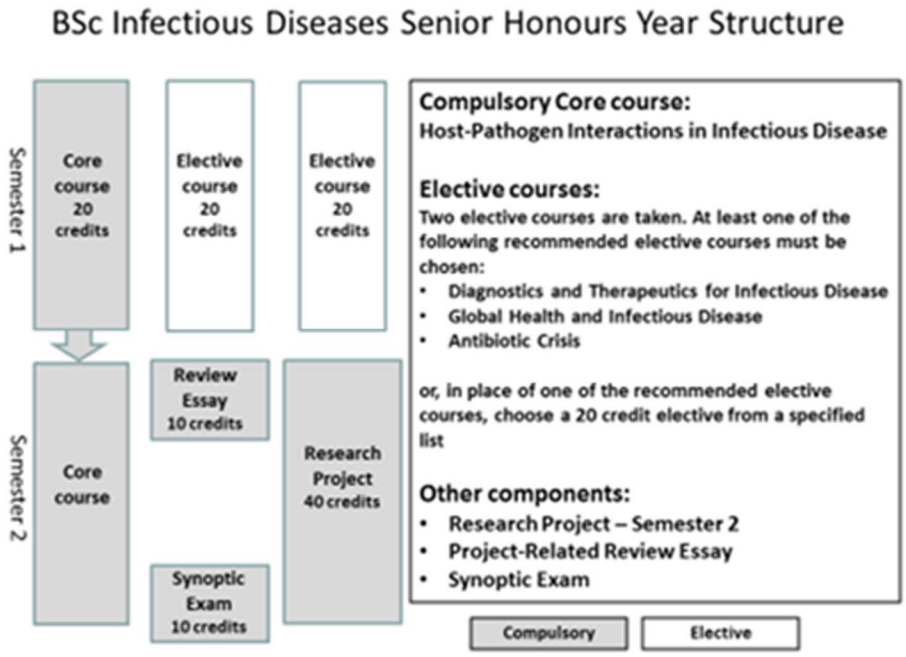
Description

The Covid-19 pandemic is, of course, the greatest global healthcare and socio-economic challenge facing us. However, it is important to remember that many other infectious diseases also represent a massive global healthcare burden and challenge, accounting for 25% of worldwide deaths annually, which rises to 43% in the developing world, and with Malaria, pneumonia and diarrhoeal disease accounting for the majority of child mortality. Healthcare systems globally are faced with the rapidly growing problem of antibiotic resistance as well as the constant threat of emerging and re-emerging infections which can lead to uncontrollable pandemics. Pathogens and the diseases that they cause are critically important to all branches of human and veterinary medicine and healthcare.

Infectious disease pathology is a result of a complex interplay between pathogens and their hosts. A wide spectrum of pathogens (viruses, bacteria, parasites, nematodes, fungi and non-conventional agents) cause hundreds of different diseases. It is only by gaining an in-depth understanding of the complex interactions between pathogen and their hosts that we can unravel the pathogen-induced disease mechanisms and then apply research advances to improve diagnostics and therapeutics so that we can more effectively detect, control, prevent and cure infectious diseases.

This programme provides comprehensive coverage of infectious diseases by integrating together the following key themes: 1, mechanisms of host-pathogen interactions; 2, global health and 3, applied aspects of infectious disease. Throughout, there is an emphasis on modern research approaches applied to these interacting themes, from the molecular to the population level.

Programme structure



The Senior Honours year is structured around the compulsory core course **'Host-Pathogen Interactions in Infectious Disease'**. This course runs throughout semesters one and two and focuses on fundamental aspects of pathogen-host interactions critical for the understanding of infectious diseases. It covers the biological mechanisms and processes which lead to pathogenesis and disease following infection. There is an emphasis on the application of modern research methods and approaches in this field. This course comprises three main themes: experimental approaches to study microbial pathogenesis; pathobiology of infection and pathogen ecology and evolution. As part of this course, each student is assigned to a tutor with whom they meet in smaller groups throughout the year to cover a variety of topics, including: scientific interpretation, data analysis, presentational skills, project management and scientific writing. In addition to the core course, three recommended Infectious Disease elective courses are offered:

Diagnostics and Therapeutics for Infectious Disease focuses on applied and translational aspects of infectious disease research. The course emphasises modern research trends in diagnostics and therapeutics which are being developed to improve the detection and treatment of infectious disease. This course covers four main themes: pathogen diagnostics; drugs targeting pathogens; vaccinology and immunotherapy for infectious disease**.**

Global Health and Infectious Disease provides an integrated overview of the challenges facing global health and healthcare systems in the face of infectious disease by covering the following themes: definition of global health; epidemiology and surveillance of infectious disease; infectious disease in the developing world; management and control of infectious disease, as well as global health challenges and opportunities.

Antibiotic Crisis focuses on antimicrobial resistance which presents an increasingly urgent global threat. This course is designed to address the emerging concepts around the interconnected routes for the development and transmission of antimicrobial resistance. It covers the "One-Health" and "Bench-to-Bedside" themes where it links the biological basis of the pathogen and host response, the sociological attitudes towards antibiotic use and prescription and the challenges faced in the use of these drugs in the clinical and non-clinical context (human and veterinary).

At least one of these required **(List 1)** Infectious Disease elective courses must be taken, but it is possible to replace one with an elective course from the List 2 options available for this programme.

The **Research Project** is completed during Semester 2 and, along with the **Project-Associated Review Essay,** accounts for 50 credit points of the final year grade. Edinburgh has one of the largest global concentrations of infectious disease research, carried out in several world-leading infectious disease research centres. Students are offered a wide choice of laboratory research projects ranging from molecular to clinical. It is also possible to select more analytical or literature-based projects.

The final course component in the year is the **Synoptic Exam** which is designed to assess your broad-based knowledge in the field of infectious diseases

Throughout the year, there are lectures, seminars, tutorials and training in the critical analysis of scientific information. There is emphasis on group work and group discussions, with the presentation of papers and research data and the exchange of ideas between students and staff helping to make this a stimulating and rewarding year. We start the year (dependent on Covid restrictions) with a trip to the Firbush outdoor activity centre which is located on the banks of Loch Tay, near Killin.

The programme combines the advanced study of pathogen biology and infectious disease with transferable skills and the development of many additional competencies which provides valuable training for careers in a wide range of disciplines. As well as biomedical sciences students, this programme delivers a particularly relevant and important study theme for intercalating medical and veterinary students.

(a) You must do the following compulsory courses

		Points
MIBM10041	Infectious Diseases Project	40
MIBM10042	Infectious Diseases Synoptic Examination	10
MIBM10053	Review Essay for Infectious Disease	10
MIBM10052	Host-pathogen interactions in Infectious Diseases	20
	Points	**80**

(b) In addition you must take at least one of the following level 10 courses from List 1.

(c) In addition, you can take 1 x 20pt, or (subject to availability and timetabling) certain 2x10pt level 10 courses from List 1 or 2

Total points 120

Compulsory Courses in the Infectious Diseases Honours Degree Programme

Code	Course Name	Prog	Sem	Time Slot
MIBM10052	Host-pathogen interactions in Infectious Diseases	InfDis	1	Wed am
Description: Lectures: This course focuses on fundamental aspects of pathogen-host interactions and covers the biological mechanisms and processes which lead to pathogenesis and disease following infection. There is an emphasis on the application of modern research methods and approaches in this field. This course comprises three main themes: Experimental approaches to study Microbial pathogenesis: Identification of virulence factors Animal models Genome wide approaches to study host-pathogen interactions Monitoring host response and immunity to pathogens Pathobiology of Infection: Survival strategies of bacterial, viral and parasite pathogens. Modulation of the host immune response Mechanisms of pathogenesis Manipulation and reprogramming of the intracellular environment Infection of the human host – Gastrointestinal Infections, Respiratory infections, CNS infections, Neonatal infection Pathogen ecology and evolution: Evolution of bacterial virulence Molecular evolution of viruses and other pathogens Tutorials: A series of tutorials will cover essay, abstract and report writing, scientific techniques, presentation skills, scientific calculations and statistics, and the critical analysis of scientific papers. The tutorials will provide important formative feedback/forward for assignments and activities in the course as a whole. This course is only available to students on the Infectious Diseases Degree Programme. Assessment: This course will be assessed through an in-course essay to be submitted in semester 1, a scientific interpretation class exam mid way through semester 2 and a final degree exam in the May diet.				

Code	Course Name	Prog	Sem	Time Slot
MIBM10041	**Infectious Diseases Project**	InfDis	2	
Description: A laboratory, literature or data handling research project in a topic of infectious disease. Presentation of research findings is a feature of this project. This course is only available to students on the Infectious Diseases Degree Programme.				
MIBM10053	**Review Essay for Infectious Disease**	InfDis	Full year	
Production of a review essay which links to the topic of the research project. This course is only available to students on the Infectious Diseases Degree Programme.				
MIBM10042	**Infectious Diseases Synoptic Examination**	InfDis	2	None
Description: Synoptic examination assessing general knowledge in Infectious Diseases. This course is only available to students on the Infectious Diseases Degree Programme.				

List 1 Infectious Diseases		
Course Code	Course Name	Teaching Time
BIME10035	Antibiotic Crisis	Thurs/Fri pm
BIME10025	Diagnostics and therapeutics for infectious disease	Thurs/Fri am
BIME10021	Global Health and Infectious Diseases	Mon/ Tues am
List 2 Infectious Diseases		
Course Code	Course Name	Teaching Time
BIME10023	Forensic Investigation	Mon/ Tues pm
BIME10036	Inflammation and Tissue Repair	Thurs/Fri pm
BIME10015	Science Communication	Mon/ Tues pm
Subject to availability: 2 x 10 credit courses from BTO		
ZLGY10031	Parasitic Diseases of Public and Veterinary Health Importance	Thurs pm
IMMU10013	Th2 in Immunity, Allergy and Health	Fri am

See appendix I on page 33 for full course details.

NEUROSCIENCE

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Neuroscience is taught jointly by staff members in the Deanery of Biomedical Sciences with major input from several research Centres and Institutes.

The **Aims of the Programme** are to:-

A. provide a thorough grounding in the basic concepts of neuroscience;
B. identify and explore current areas of debate and controversy;
C. encourage active participation through discussion and criticism of recent research in selected areas of basic, translational and clinical neuroscience research.

The programme in the **first Semester** comprises a compulsory course on **General Neuroscience** together with **two Elective Courses** chosen by the student. These optional courses allow students to specialise in particular aspects of neuroscience in which they have an interest. In the **second Semester** students continue with **General Neuroscience**, undertake a **Project Preview Dissertation** as well as carrying out **supervised research**, either for a laboratory-based or for an individual analysis or small group **Dissertation**. Students are required to submit their written Dissertations after presenting them orally, after the Spring vacation.

The General Neuroscience and Elective Courses employ a variety of teaching methods, which may include lectures, seminars, tutorials, small group discussions and demonstrations. There are some restrictions on elective course choice due to time-tabling and resource availability. Some courses also have different requirements for entry from the programme as a whole.

Examinations
The Neuroscience Project is worth 40 credits, General Neuroscience is worth 20 credits, the Project Preview Dissertation course is worth 10 credits and each Elective Course is worth 20 credits. The first Semester Elective courses are assessed by either a written examination at the end of the semester or in-course assessments or a combination of both ICA and written examination. The assessment for the General Neuroscience course comprises in-course assessments in Semesters 1 & 2. The Project Preview Dissertation course in Semesters 1& 2 is examined by In-Course Assessment. This is then followed by the Neuroscience Project in semester 2 which is examined by a presentation (5 credits) and dissertation (35 credits) submitted in May There is a Synoptic Examination in the May diet (10 Credits). The written examinations assess evidence-based critical reading skills and the knowledge and understanding of Neuroscience that students are expected to have gained from their studies throughout the year.

Exam papers from previous years at
http://www.ed.ac.uk/schools-departments/information-services/library-museum-gallery/exam-papers

Career Prospects

The demand for graduates in neuroscience is broadly similar to that for other biomedical sciences graduates. Many companies in the pharmaceutical industry have major programmes of drug development for the treatment of nervous system disorders. There are also openings in Universities in Departments or Schools of Biology, Biomedical Sciences, Neuroscience or Psychology for students interested in doing postgraduate research. The evidence-based, critical skills that students acquire and develop during the

Honours Neuroscience programme are also transferable and of generic value to employers in many other walks of life.

(a) You must do the following compulsory courses

		Points
NEBM10005	Neuroscience Project	40
NEBM10028	General Neuroscience	20
NEBM10019	Neuroscience Synoptic Examination	10
NEBM10035	Neuroscience Project Preview Dissertation	10
	Points	**80**

(b) In addition you must take 2 level 10 courses. One is required from List 1, the second elective can be from List 1 (recommended) or 2* (see appendix I).
*Students who wish a broader fourth year programme may choose, subject to the approval of the Honours Programme Organiser, other level 10 or 11 courses from outside Biomedical Sciences. Students wishing to do this should first discuss it with the Neuroscience Honours Programme Organiser and their Personal Tutor. Approval will only be given for courses that fit appropriately with the Neuroscience Honours programme and for which the student is suitably qualified. The requirement for these courses to be at level 10 or 11 means that students wishing to take this option should plan for this early in their University career. Otherwise, earlier course choices may limit later options.

Total points 120

Compulsory Courses for the Neuroscience Honours Degree Programme

Code	**Course Name**	**Prog**	**Sem**	**Time Slot**
NEBM10028	**General Neuroscience**	Neurosci	1&2	Wed am
Description: This course covers aspects of cognitive, systems, cellular, molecular, developmental and clinical neuroscience with the aim of educating students in the breadth of the subject, and providing training and development in evidence-based critical reading and writing skills, data acquisition and analysis. The course will include critical reading of original research literature and analysis of experimental results in neuroscience. We also highlight current controversies and challenges for the 21st Century in Neuroscience, partly by asking teachers and experienced researchers to speak about their subject area then leading students through specific aspects of the topic. The aim is to encourage critical thinking and evaluation of evidence, crucial to the development of a neuroscientist. These skills are also of practical value in dealing with material on the Elective Courses and students' independent research towards their Dissertation. Only available to students on the Neuroscience Degree Programme.				
NEBM10035	**Neuroscience Project Preview Dissertation**	Neurosci	1&2	Wed
A literature review covering material directly related to the subject of the research project. The aims are to write a preview based on the student's project title that summarises not only the recent advances made but the controversies of past and present, which leads to a key hypothesis relevant to their dissertation. In doing so one should develop an accurate description of current wisdom in the field.				
NEBM10005	**Neuroscience Project**	Neurosci	2	None
Description: Students will spend the second semester on original studies either based on literature and/or data analysis research or projects in individual research laboratories. During the first teaching block students will mostly work on their projects and will be trained in research methods by the Project management course. The second block will be spent by the student on full-time research. The results of the student's research will be formally presented to the whole class and examiners and also written up as a Dissertation, which is independently marked by at least two markers. Projects will normally be selected from a list approved by the Board of Examiners but students may choose their own topics, subject to approval by the Board of Examiners. Both literature and/or data analysis-based and laboratory-based projects are considered of equal value: both provide ample opportunities for students to demonstrate their creative, critical and analytical skills. All projects will be allocated to students via the Project Portal. Only available to students on the Neuroscience Degree Programme.				
NEBM10019	**Neuroscience Synoptic Examination**	Neurosci	2	None

Description: Synoptic examination assessing general knowledge and understanding of Neuroscience and its contemporary relevance. Only available to students on the Neuroscience Degree Programme.

List 1 Neuroscience		
Course Code	Course Name	Teaching Time
BIME10027	Development and Disease	Mon/ Tues am
BIME10026	Developmental and Clinical Neuroscience	Mon/ Tues pm
BIME10022	Genetic and Environmental Influences on Behaviour and Mental Health	Mon/ Tues pm
BIME10020	Hormones & Behaviour	Thurs/Fri am
BIME10011	Neural circuits for learning and memory	Mon/ Tues am
BIME10070	Neurobiology of Cognition in Health and Disease	Mon/ Tues pm
BIME10032	Neurodegeneration, obesity and cancer: genetics and beyond	Thurs/Fri am
BIME10008	Neurotransmitters In Action	Thurs/Fri pm
BIME10014	Sensory Physiology and Dysfunction	Mon/ Tues am
List 2 Neuroscience		
Course Code	Course Name	Teaching Time
BIME10035	Antibiotic Crisis	Thurs/Fri pm
BIME10030	Cancer Biology and Medicine	Mon/ Tues am
BIME10029	Cardiovascular Pharmacology & Therapeutics	Thurs all day/Fri am
BIME10028	Conception to Parturition	Thurs/Fri am
BIME10025	Diagnostics and therapeutics for infectious disease	Thurs/Fri am
BIME10024	Endocrine Physiology and Pharmacology	Thurs/Fri am
BIME10023	Forensic Investigation	Mon/ Tues pm
BIME10074	Gametes and Gonads	Mon/ Tues am
BIME10021	Global Health and Infectious Diseases	Mon/ Tues am
BIME10073	Human Genetics and Molecular Medicine	Thurs/Fri am
BIME10036	Inflammation and Tissue Repair	Thurs/Fri pm
BIME10009	Neuroimaging	Mon/ Tues pm
BIME10017	Regenerative Medicine	Mon/ Tues am
BIME10037	Reproductive Cancers	Mon/ Tues pm
BIME10015	Science Communication	Mon/ Tues pm

Subject to availability: Informatics		
INFR10069	Introductory Applied Machine Learning	Lectures Mon/Thurs pm

See appendix I on page 33 for full course details.

PHARMACOLOGY

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Pharmacology is taught by biomedical scientists and clinicians from the schools and research centres in the College of Medicine and Veterinary Medicine. Teaching staff are pharmacologists, clinical pharmacologists and specialists from other relevant disciplines (neuroscience, physiology, cardiovascular and inflammatory diseases, and endocrinology) and all have active research students. Courses within the programme reflect the research interests of these laboratories. The Pharmacology Honours programme provides insight into current concepts and experimental techniques in various areas of pharmacology, physiology, biochemistry, genetics and molecular biology.

The programme has two main objectives to develop generic skills of critical analysis and to develop understanding of pharmacological experimentation. To achieve the first objective, the programme will develop the effective and critical use of primary and secondary sources of published information. This is achieved by teaching mainly in the form of interactive seminars with pre-circulated reading lists, supported by a tutorial system. Transferable skills (e.g. knowledge of information technology and use of computer packages, good written and oral presentation, group working) are also emphasised. The second objective seeks to gain an understanding of experimental approaches to biological questions, and to facilitate the acquisition of the wide range of skills needed to solve pharmacological problems. This is achieved by placing a strong emphasis on individual literature and/or data analysis or laboratory research projects, to which a large part of the second Semester is devoted.

In the first Semester all students attend the Core programme of study entitled "*Drugs, Receptors and Therapeutics*" (Wednesdays morning) plus two elective courses. Students are required to take at least one elective course which is directly pertinent to pharmacology (see List 1), the second elective may be chosen from either List 1 or List 2. List 1 electives include courses which focus on cardiovascular pharmacology, endocrine pharmacology, cancer biology, neuropharmacology and neurotransmitter action and receptor signalling and regulation. The choice of the second elective can be broader and reflect a student's own specific interests although in the past, students have benefited from selecting courses with a strong pharmacological component (such as those in List 1) and/or where there is synergy in content.

In the second Semester the Core "*Drugs, Receptors and Therapeutics*" course continues but the focus turns to the dissertation which will either be laboratory or library-based. Students can elect to carry out a literature and/or data analysis-based research project on, for example, a pharmacological topic in which they have developed a particular interest. Alternatively, students may decide to carry out a laboratory-based project during the second Semester. All projects will be allocated to students via the Project Portal.

Assessment

Pharmacology 4 assessment is based on 120 credit points. The dissertation (including oral presentation) is worth 40 credit points. Elective Courses (see List 1 and 2) taken in Semester 1 carry 20 credit points and will be assessed by either a written examination at the end of the semester during weeks 12/13 or in-course assessments (ICA) or a combination of both ICA and written examination. The compulsory course "*Drugs, Receptors and Therapeutics"* (20 credit points) runs in Semester 1 and part of Semester 2. This course will be assessed by examination in the May diet of Semester 2, and will incorporate in-course assessments in Semester 1. The Pharmacology Project Milestones Dissertation (10 credit points) and the Synoptic Examination (10 credit points) in the May Diet make up the remaining credit points of your Senior Honours Year.

Career prospects

There is a strong demand for graduates in pharmacology from the pharmaceutical, chemical, and biotechnology industries. Graduates are recruited with either Honours degrees or higher degrees (MSc,

PhD) in Pharmacology for employment including pure laboratory-based research, routine analysis of drug potency, manufacturing processes, clinical trials, toxicology, regulatory affairs, information technology and administration - sales, marketing, and project management. Each year about 40% of the Pharmacology graduates proceed to a higher degree, usually a PhD, in a variety of academic departments and research institutes. Various other careers are possible, including: research assistants in clinical pharmacology; management in the civil service, retail and financial sectors; forensic science; school teaching. Further details and advice are available from the Careers Service.

(a) You must do the following compulsory courses:

		Points
PHBM10018	Pharmacology Project	40
PHBM10017	Pharmacology Synoptic Examination	10
PHBM10036	Drugs, Receptors and Therapeutics	20
PHBM10035	Pharmacology Project Milestones Dissertation	10
	Points	**80**

(b) In addition you must take 2 level 10 courses. One is required from List 1, the second elective can be from List 1 or 2 (see appendix I).

Total points 120

Compulsory Courses for the Pharmacology Honours Degree Programme

Code	Course Name	Prog	Sem	Time Slot
PHBM10018	**Pharmacology Project**	Pharm	2	
Description: Dissertation based on a library or a laboratory based research project. This course is only available to students on the Honours Pharmacology Degree Programme and is compulsory for those students. Contact teaching hours/weeks: (a) Library based Project: Normally full time weeks 19-25. (b) Laboratory Project: Normally part time weeks 14-18 then full time.				
PHBM10036	**Drugs, Receptors and Therapeutics**	Pharm	1 & 2	Wed
An understanding of the molecular pharmacology of receptors in relation to the action of drugs underpins many aspects of the courses within the Honours Pharmacology Programme. A series of lectures will be given to provide an overview of topics including: action of drugs at receptors, structure-function relationships for the different classes of receptor, the signalling processes following receptor activation and receptor cloning and expression. This course will also provide a coherent perspective of how drugs are developed from a molecular target through preclinical development to clinical trials. It will consider how academic pharmacology can interact with drug development or can be focused on discovery of molecular mechanisms independent of immediate therapeutic potential. The economic drivers and processes in the industrial and academic domains will be considered. There will be opportunity to meet with Programme tutors in small groups. The purpose of the tutorials is to provide student access to a member of staff and to cover general aspects related to Pharmacology. Students will be encouraged to submit essays to tutors in order to practice and obtain feedback on their writing skills. This course is only available to students on the Honours Pharmacology Degree Programme.				
PHBM10035	**Pharmacology Project Milestones Dissertation**	Pharm	1 & 2	
Students are expected to review the historical literature and identify the research milestones that directly contributed to our current understanding of the field of research addressed by the objectives of your project (see below). You will be required to write a historical perspective based on your literature review that addresses not only the advances made, but also the controversies of past and present, which places each research milestone in a timeline. In doing so one should develop an accurate description of current wisdom in the field. This course is only available to students on the Honours Pharmacology Degree Programme.				
PHBM10017	**Pharmacology Synoptic Examination**	Pharm	2	None
Description: Synoptic examination assessing general expertise in Pharmacology. This course is only available to students on the Honours Pharmacology Degree Programme.				

List 1 Pharmacology		
Course Code	Course Name	Teaching Time
BIME10035	Antibiotic Crisis	Thurs/Fri pm
BIME10030	Cancer Biology and Medicine	Mon/ Tues am
BIME10029	Cardiovascular Pharmacology & Therapeutics	Thurs all day/Fri am
BIME10025	Diagnostics and therapeutics for infectious disease	Thurs/Fri am
BIME10024	Endocrine Physiology and Pharmacology	Thurs/Fri am
BIME10073	Human Genetics and Molecular Medicine	Thurs/Fri am
BIME10008	Neurotransmitters In Action	Thurs/Fri pm
List 2 Pharmacology		
Course Code	Course Name	Teaching Time
BIME10028	Conception to Parturition	Thurs/Fri am
BIME10027	Development and Disease	Mon/Tues am
BIME10026	Developmental and Clinical Neuroscience	Mon/ Tues pm
BIME10062	Emergency Medicine	Thurs/Fri pm
BIME10074	Gametes and Gonads	Mon/ Tues am
BIME10022	Genetic and Environmental Influences on Behaviour and Mental Health	Mon/ Tues pm
BIME10021	Global Health and Infectious Diseases	Mon/ Tues am
BIME10020	Hormones & Behaviour	Thurs/Fri am
BIME10036	Inflammation and Tissue Repair	Thurs/Fri pm
BIME10011	Neural circuits for learning and memory	Mon/ Tues am
BIME10070	Neurobiology of Cognition in Health and Disease	Mon/ Tues pm
BIME10032	Neurodegeneration, obesity and cancer: genetics and beyond	Thurs/Fri am
BIME10017	Regenerative Medicine	Mon/ Tues am
BIME10037	Reproductive Cancers	Mon/ Tues pm
BIME10014	Sensory Physiology and Dysfunction	Mon/ Tues am

See appendix I on page 33 for full course details.

PHYSIOLOGY

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Physiology aims to understand *'the normal processes and functions of the body'* and is central to our ability to identify and ultimately treat disease. Completion of the sequencing of the human genome only serves to re-emphasise the significant knowledge gap between the basic parts catalogues generated from powerful reductionist strategies and our understanding of how gene products integrate at the cellular, systems and whole-organism level. This has led to a renaissance in physiological research with advances in the integration of molecular and proteomic analysis with genetically tractable model organisms, imaging technology, and predictive modelling. Such an integrative approach, bridging multiple organ systems, is beginning to reveal novel mechanisms, fundamental physiological principles and therapeutic targets for treatment of major human diseases. The modern physiologist requires the creativity and literacy to fully exploit the strengths of the reductionist and predictive biology approaches with the relevance of whole-organism analysis. Importantly, public dissemination of the basic mechanisms that underpin medicine is essential for rationale debate for new treatments and the debunking of the many pseudo-scientific approaches that widely pervade the media.

Students study in depth selected topics in physiology that encompass analysis and integration from genes to cells to the whole organism to generate understanding of physiological processes in the context of whole body homeostasis. The programme reflects the research interests of staff that contribute to it. Students are encouraged to develop a critical knowledge of the subject, based where possible on their own practical experience.

All students take the compulsory Physiology Core course, that emphasises core skills and a broad range of current 'hot-topics' in Physiology. This course will be assessed by ICA during the course and a paper analysis examination at the end of the second semester, which will require data analysis and interpretation skills acquired during the programme. All students will select two taught elective courses in semester one. The first semester elective courses will be assessed by either a written examination at the end of the semester, during weeks 12/13, or in-course assessments (ICA) or a combination of both ICA and written examination. Physiology is an experimental science relying on the scientific method, in which experiments may be rigorously designed, critically evaluated and reproduced to test key hypotheses with open access and freely distributed to scientists everywhere. As such, a major component of the programme is the research project undertaken in the second semester. The research project is assessed by a written dissertation and an oral presentation. Students also complete a Physiology Synoptic Exam (semester 2) that provides an opportunity for students to critically discuss broader questions in Physiology.

As an honours student studying Physiology:

(a) You must do the following compulsory courses

		Points
PYBM10001	Physiology Project	40
PYBM10030	Physiology Core	20
PYBM10033	Physiology Grant Proposal	10
PYBM10034	Physiology Synoptic Exam	10
	Points	**80**

(b) In addition you must take 2 level 10 courses. One is required from List 1, the second elective can be from List 1 or 2 (see appendix I).

Total points 120

Compulsory Courses for the Physiology Honours Degree Programme

Code	**Course Name**	**Prog**	**Sem**	**Time Slot**
PYBM10030	**Physiology Core**	Physiol	1 and 2	Wed am
Description: The course will introduce the discipline of modern Physiology and emphasise the multidisciplinary nature of the subject. Students will be introduced to current concepts in human and mammalian physiology starting from gene expression, through protein and cell physiology, culminating in organ and systems physiology. Modern approaches and techniques for the study of physiology will also be discussed. Teaching will take the form of lectures, demonstrations, and self-directed group tasks. Key skills will be reinforced in the course, including: 1. How to interpret and analyse scientific papers and the physiological data in them. 2. How to statistically analyse and present data effectively in written and oral presentations. This is considered essential preparation for the **Physiology Core Paper Analysis Exam** (worth 75% of the mark for the course). On the basis of reading a current scientific paper this exam will test your analytical skills by, for example, assessing your abilities to handle data, interpret experiments and develop new experimental plans. In addition, there will be an ICA component summarising a current research topic in physiology (worth 25% of the mark for the course). This course is only available to students on the Physiology Honours Degree Programme.				
PYBM10001	**Physiology Project**	Physiol	2	None
Description: Students will be asked to perform novel research in a topical area of physiology. Students will be supervised by a mentor who will guide their progress through the project. All students will present a written dissertation (worth 87.5% of the project mark) and give an oral presentation of the project (worth 12.5% of the project mark). This course is only available to students on the Physiology Honours Degree Programme.				
PYBM10033	**Physiology Grant Proposal**	Physiol	2	None
All students in Physiology Honours will write a Grant Proposal. This course will provide insights into the design of experiments and how hypotheses are formulated. This course is only available to students on the Physiology Honours Degree Programme.				
PYBM10034	**Physiology Synoptic Examination**	Physiol	1 & 2	None
Description: The course will introduce the discipline of modern physiology and emphasise the core concepts and multidisciplinary nature of the subject together with the experimental approaches and techniques used in its study. Students will practice how to structure a critical and logically argued general essay in physiology bringing evidence from across the honours year(s) in preparation for the final written physiology exam essay. This course is only available to students on the Physiology Honours Degree Programme.				

List 1 Physiology		
Course Code	Course Name	Teaching Time
BIME10027	Development and Disease	Mon/Tues am
BIME10024	Endocrine Physiology and Pharmacology	Thurs/Fri am
BIME10074	Gametes and Gonads	Mon/ Tues am

BIME10022	Genetic and Environmental Influences on Behaviour and Mental Health	Mon/ Tues pm
BIME10020	Hormones & Behaviour	Thurs/Fri am
BIME10032	Neurodegeneration, obesity and cancer: genetics and beyond	Thurs/Fri am
BIME10037	Reproductive Cancers	Mon/ Tues pm
BIME10014	Sensory Physiology and Dysfunction	Mon/ Tues am
List 2 Physiology		
Course Code	Course Name	Teaching Time
BIME10035	Antibiotic Crisis	Thurs/Fri pm
BIME10030	Cancer Biology and Medicine	Mon/ Tues am
BIME10029	Cardiovascular Pharmacology & Therapeutics	Thurs all day/Fri am
BIME10028	Conception to Parturition	Thurs/Fri am
BIME10026	Developmental and Clinical Neuroscience	Mon/ Tues pm
BIME10025	Diagnostics and therapeutics for infectious disease	Thurs/Fri am
BIME10023	Forensic Investigation	Mon/ Tues pm
BIME10021	Global Health and Infectious Diseases	Mon/ Tues am
BIME10073	Human Genetics and Molecular Medicine	Thurs/Fri am
BIME10036	Inflammation and Tissue Repair	Thurs/Fri pm
BIME10011	Neural circuits for learning and memory	Mon/ Tues am
BIME10070	Neurobiology of Cognition in Health and Disease	Mon/ Tues pm
BIME10008	Neurotransmitters In Action	Thurs/Fri pm
BIME10017	Regenerative Medicine	Mon/ Tues am
BIME10015	Science Communication	Mon/ Tues pm

See appendix I on page 33 for full course details.

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REPRODUCTIVE BIOLOGY

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Basic research in reproductive biology has been applied to solve many problems, including in medicine, wildlife management and agriculture. Laboratory-based research continues to provide new insights into reproductive processes and has helped to shape some of the powerful new analytical research tools such as the production of transgenic animals and cloning. Reproductive Biology has also provided the scientific background for *in vitro* fertilization, intra-cytoplasmic sperm injection and other assisted reproduction techniques that have revolutionised reproductive medicine and veterinary practice in recent decades. Increasingly, the reproductive system is recognised as a unique model for many other physiological processes in health and disease, involving cyclical episodes of inflammation, angiogenesis and tissue remodelling, processes normally associated only with development or pathology.

This honours programme focuses on understanding the biological principles in reproductive processes, and extrapolating these to the fields of human and veterinary medicine. Specific training areas emphasize reproduction and early development, gonadal function, pregnancy and lactation, biotechnology and reproduction, reproductive neuroscience, and the reproduction of domestic and endangered animals. This programme therefore offers both breadth and focus to students with interests in the field of reproductive biology as they pertain to understanding basic biological mechanisms, and to their potential application to block or treat abnormal and disease processes.

Aims and objectives of the Programme

The honours year will provide you with a base of specialist information and knowledge, together with developing your transferable professional skills and talents.

Through gaining a broad critical understanding of reproductive biology alongside a detailed comprehension of selected areas, the aim is to allow you to develop your skills and talents, along with your personal and professional insight, to enable you to fulfil your potential for high personal and professional achievement entering your chosen career pathway.

Learning Outcomes

Through participation in the interlinked courses, the Reproductive Biology Programme will enable you to develop:

- An in depth knowledge and deep and critical understanding of the established field and its future directions.

- A wide range of generic scientific skills and experimental and analysis methodologies applied in the reproductive and biomedical science context. This includes developing and testing scientific hypotheses, designing, planning and then implementing these by experiment and/or data collection, and analysing and critically interpreting data in the context of current understanding in the specific field of study.

- Your ability to utilise principles, skills and knowledge to offer critical analysis and professional insight, solve problems and deal with uncertainty within the reproductive biology and biomedical science fields, and how to apply those skills outside the field.
-
- Your generic professional scientific communication skills of scientific writing and presentation, including public engagement.

- Your autonomy to manage your own learning and professional skill development, and working with peers, teachers and specialists.

- Your ability to reflect on your learning process, identify your graduate attributes and relate your journey through the Programme to your career aspirations.

Across semesters 1 & 2 students take a compulsory core course (Research Skills in Reproductive Biology). In addition, there are 2 elective courses, at least one of which will be one of the four core reproductive biology based electives, namely: 'Conception to Parturition', 'Gametes and Gonads', 'Reproductive Cancers' and 'Sex Determination'. Elective courses can be assessed by a mix of in course assessment (ICA) and examination.

In Semester 2 students do the compulsory Reproductive Biology Project Reflective Portfolio of Learning course (ICA), and a research project, often laboratory-based, but which can also be a clinical/audit or library-based project. The assessed components of the honours project include a project dissertation, and a project presentation. Projects will be offered by staff in the MRC Centre for Reproductive Health, Obstetrics and Gynaecology, Biomedical Sciences, Royal Dick Veterinary School, The Roslin Institute, Biological Sciences, the Royal Zoological Society of Scotland, Royal Infirmary and Western General Hospital, and elsewhere.

The Synoptic Examination at the end of Semester 2 will cover a range of material from the across the Honours Programme.

As an honours student studying Reproductive Biology:
(a) You must do the following compulsory courses

		Points
REPB10003	Reproductive Biology Project	40
REPB10002	Reproductive Biology Synoptic Examination	10
REPB10005	Reproductive Biology Project Reflective Portfolio of Learning	10
REPB10004	Research Skills in Reproductive Biology	20
	Points	**80**

(b) In addition you must take 2 further level 10 elective courses.
At least one of these elective courses must be from List 1; **Gametes to Gonads**, **Reproductive Cancers**, **Conception to Parturition** and **Sex Determination** undertaking both electives from List 1 is **recommended.**

Alternatively, one elective course can be from list 2.

Total points 120

Compulsory Courses for the Reproductive Biology Honours Degree Programme

Code	Course Name	Prog	Sem	Time Slot
REPB10003	**Reproductive Biology Project**	RepBiol	2	None
Description: A laboratory- or library-based project carried out throughout the second semester. This course is only available to students on the Reproductive Biology Honours Degree Programme.				
REPB10005	**Reproductive Biology Project Reflective Portfolio of Learning**	RepBiol	2	
Description: This course develops your ability to propose robust scientific hypotheses, and offers you a learning framework to reflect on your acquisition of academic, professional and personal skills when choosing, planning for, and during your Honours Project. This course is only available to students on the Reproductive Biology Honours Degree Programme.				
REPB10004	**Research Skills in Reproductive Biology**	RepBiol	1 & 2	Wed am
This course aims to equip you with core research skills and covers the experimental systems used in reproductive biology, together with key transferable communication skills to assist you during the Honours Programme. This course is only available to students on the Reproductive Biology Honours Degree Programme.				

REPB10002	**Reproductive Biology Synoptic Examination**	RepBiol	2	None
Description: A synthesis of knowledge gained from the different components of the Reproductive Biology Honours course. This course is only available to students on the Reproductive Biology Honours Degree Programme.				

List 1 Reproductive Biology		
Course Code	Course Name	Teaching Time
BIME10028	Conception to Parturition	Thurs/Fri am
BIME10074	Gametes and Gonads	Mon/ Tues am
BIME10037	Reproductive Cancers	Mon/ Tues pm
BIME10047	Sex Determination	Mon/ Tues pm
List 2 Reproductive Biology		
Course Code	Course Name	Teaching Time
BIME10035	Antibiotic Crisis	Thurs/Fri pm
BIME10049	Biomedicine, Law and Society	Thurs am
BIME10029	Cardiovascular Pharmacology & Therapeutics	Thurs all day/Fri am
BIME10027	Development and Disease	Mon/Tues am
BIME10025	Diagnostics and therapeutics for infectious disease	Thurs/Fri am
BIME10024	Endocrine Physiology and Pharmacology	Thurs/Fri am
BIME10023	Forensic Investigation	Mon/ Tues pm
BIME10022	Genetic and Environmental Influences on Behaviour and Mental Health	Mon/ Tues pm
BIME10021	Global Health and Infectious Diseases	Mon/ Tues am
BIME10020	Hormones & Behaviour	Thurs/Fri am
BIME10073	Human Genetics and Molecular Medicine	Thurs/Fri am
BIME10036	Inflammation and Tissue Repair	Thurs/Fri pm
BIME10063	Medical Anthropology	Thurs/Fri pm
BIME10032	Neurodegeneration, obesity and cancer: genetics and beyond	Thurs/Fri am
BIME10009	Neuroimaging	Mon/ Tues pm
BIME10008	Neurotransmitters In Action	Thurs/Fri pm
BIME10017	Regenerative Medicine	Mon/ Tues am
BIME10015	Science Communication	Mon/ Tues pm
BIME10055	Scientific Frontiers of Medicine	Mon/ Tues am

See appendix I on page 33 for full course details.

HONOURS ELECTIVE COURSE SUMMARIES

Please note that the elective courses are subject to change. Summaries of all courses are available on the DRPS and PATH. All courses have a quota on the number of places available.

NB any location and mode of delivery is subject to change in response pandemic related restrictions.

Code	Course Name	Time Slot	Anatomy and Development		Biomedical Sciences		Infectious Diseases		Neuroscience		Pharmacology		Physiology		Reproductive Biology	
			List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2
BIME10048	**Anatomy of the Head and neck**	**Thurs/ Fri am**	Y		Y											
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10048.htm Main Teaching Location: Central																
BIME10045	**Anatomy of the Limbs**	**Thurs/ Fri pm**	Y		Y											
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10045.htm Main Teaching Location: Central																
BIME10035	**Antibiotic Crisis**	**Thurs/ Fri pm**			Y		Y			Y	Y			Y		Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10035.htm Main Teaching Location: Central																
BIME10046	**Applied Human Osteology**	**Mon/ Tues am**	Y		Y											
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10046.htm Main Teaching Location: Central																
BIME10049	**Biomedicine, Law and Society**	**Thurs am**														Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10049.htm Main Teaching Location: Central																
BIME10030	**Cancer Biology and Medicine**	**Mon/ Tues am**		Y	Y					Y	Y			Y		
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10030.htm Main Teaching Location: Western General Hospital																
BIME10029	**Cardiovascular Pharmacology & Therapeutics**	**Thurs all day/Fri am**		Y	Y					Y	Y			Y		Y
http:/www.drps.ed.ac.uk/21-22/dpt/cxbime10029.htm Main Teaching Location: Little France																

Code	Course Name	Time Slot	Anatomy and Development		Biomedical Sciences		Infectious Diseases		Neuroscience		Pharmacology		Physiology		Reproductive Biology	
			List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2
BIME10028	**Conception to Parturition**	**Thurs/ Fri am**	Y		Y					Y		Y		Y	Y	
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10028.htm Main Teaching Location: Little France																
BIME10027	**Development and Disease**	**Mon/ Tues am**	Y		Y				Y			Y	Y			Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10027.htm Main Teaching Location: Central																
BIME10026	**Developmental and Clinical Neuroscience**	**Mon/ Tues pm**	Y		Y				Y			Y		Y		
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10026.htm Main Teaching Location: Little France																
BIME10025	**Diagnostics and therapeutics for infectious disease**	**Thurs/ Fri am**			Y		Y			Y	Y			Y		Y
http:/www.drps.ed.ac.uk/21-22/dpt/cxbime10025.htm Main Teaching Location: Central																
BIME10062	**Emergency Medicine**	**Thurs/ Fri pm**										Y				
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10062.htm Main Teaching Location: Little France																
BIME10024	**Endocrine Physiology and Pharmacology**	**Thurs/ Fri am**		Y	Y					Y	Y		Y			Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10024.htm Main Teaching Location: Little France																
BIME10023	**Forensic Investigation**	**Mon/ Tues pm**		Y	Y			Y		Y				Y		Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10023.htm Main Teaching Location: Central																
BIME10074	**Gametes and Gonads**	**Mon/ Tues am**		Y	Y					Y		Y	Y		Y	
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10074.htm Main Teaching Location: Little France																

Code	Course Name	Time Slot	Anatomy and Development		Biomedical Sciences		Infectious Diseases		Neuroscience		Pharmacology		Physiology		Reproductive Biology	
			List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2
BIME10022	**Genetic and Environmental Influences on Behaviour and Mental Health**	**Mon/ Tues pm**		Y	Y				Y			Y	Y			Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10022.htm Main Teaching Location: Little France/Western General Hospital																
BIME10021	**Global Health and Infectious Diseases**	**Mon/ Tues am**			Y		Y			Y		Y		Y		Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10021.htm Main Teaching Location: Central																
BIME10020	**Hormones & Behaviour**	**Thurs/ Fri am**		Y	Y				Y			Y	Y			Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10020.htm Main Teaching Location: Central																
BIME10073	**Human Genetics and Molecular Medicine**	**Thurs/ Fri am**		Y	Y					Y	Y			Y		Y
http:/www.drps.ed.ac.uk/21-22/dpt/cxbime10073.htm Main Teaching Location: Western General Hospital																
BIME10036	**Inflammation and Tissue Repair**	**Thurs/ Fri pm**		Y	Y			Y		Y		Y		Y		Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10036.htm Main Teaching Location: Little France																
BIME10063	**Medical Anthropology**	**Thurs/ Fri pm**														Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10063.htm Main Teaching Location: Central																
BIME10011	**Neural circuits for learning and memory**	**Mon/ Tues am**		Y	Y				Y			Y		Y		
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10011.htm Main teaching location: Central																
BIME10070	**Neurobiology of Cognition in Health and Disease**	**Mon/ Tues pm**		Y	Y				Y			Y		Y		
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10070.htm Main Teaching Location: Central																

Code	Course Name	Time Slot	Anatomy and Development		Biomedical Sciences		Infectious Diseases		Neuroscience		Pharmacology		Physiology		Reproductive Biology	
			List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2
BIME10032	**Neurodegeneration, obesity and cancer: genetics and beyond**	**Thurs/ Fri am**		Y	Y				Y			Y	Y			Y
Web link to Course Description: http://www.drps.ed.ac.uk/21-22/dpt/cxbime10032.htm Main Teaching Location: Central																
BIME10009	**Neuroimaging**	**Mon/ Tues pm**		Y	Y					Y						Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10009.htm Main Teaching Location: Online * N.B. this course is almost exclusively delivered through online methods. Timetable allocation refers to limited staff contact sessions																
BIME10008	**Neurotransmitters In Action**	**Thurs/ Fri pm**		Y	Y				Y		Y			Y		Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10008.htm Main Teaching Location: Central																
BIME10017	**Regenerative Medicine**	**Mon/ Tues am**	Y		Y					Y		Y		Y		Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10017.htm Main Teaching Location: Little France																
BIME10037	**Reproductive Cancers**	**Mon/ Tues pm**		Y	Y					Y		Y	Y		Y	
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10037.htm Main Teaching Location: Western General Hospital																
BIME10015	**Science Communication**	**Mon/ Tues pm**		Y	Y			Y		Y				Y		Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10015.htm Main Teaching Location: Central																
BIME10055	**Scientific Frontiers of Medicine**	**Mon/ Tues am**		Y												Y
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10055.htm Main Teaching Location: Little France																

Code	Course Name	Time Slot	Anatomy and Development		Biomedical Sciences		Infectious Diseases		Neuroscience		Pharmacology		Physiology		Reproductive Biology	
			List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2	List 1	List 2
BIME10014	**Sensory Physiology and Dysfunction**	**Mon/ Tues am**		Y	Y				Y			Y	Y			
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10014.htm Main Teaching Location: Central																
BIME10047	**Sex Determination**	**Mon/ Tues pm**	Y		Y										Y	
http://www.drps.ed.ac.uk/21-22/dpt/cxbime10047.htm Main Teaching Location: Central																
Biology Courses																
ZLGY10031	Parasitic Diseases of Public and Veterinary Health Importance	**Thurs pm**						Y								
Web link to Course Description: http://www.drps.ed.ac.uk/21-22/dpt/cxzlgy10031.htm Main Teaching Location: Kings Buildings																
IMMU10013	**Th2 in Immunity, Allergy and Health**	**Fri am**						Y								
Web link to Course Description http:/www.drps.ed.ac.uk/21-22/dpt/cximmu10013.htm Main Teaching Location: Kings Buildings																
Informatics Courses										Y						
INFR10069	**Applied Machine Learning**	**Mon/ Thurs pm**														
http:/www.drps.ed.ac.uk/21-22/dpt/cxinfr10069.htm Main Teaching Location: Central																