School of Biological Sciences Royal Holloway University of London

1 Summary of Degree Structure

Full details about each programme of study, including the aims, learning outcomes to be achieved on completion, courses which make up the programme and any programme-specific regulations are set out in the programme specifications.

1.1 Degree Programmes

MOLECULAR BIOSCIENCE DEGREES
Biochemistry
Biomedical Sciences
Medical Biochemistry
Molecular Biology

ORGANISMAL BIOSCIENCE DEGREES
Biology
Ecology and the Environment
Zoology

MOLECULAR BIOSCIENCE DEGREES

C700 Biochemistry provides a comprehensive coverage of the principles of biochemistry together with a range of more advanced course options dealing with a broad spectrum of modern and topical developments in animal, microbial and plant biochemistry and molecular biology. A good degree of flexibility is possible in the second and final years and you may also select up to one course unit from those offered by other departments if timetabling allows, and if agreed by the Heads of School/Department in SBS and in the host department.

B990 Biomedical Sciences. This degree programme focuses on understanding the biological basis of human disease and is primarily designed for students considering employment in biomedical research. The first year provides a core background in a range of subjects including biochemistry, physiology, cell biology, molecular biology and genetics. In the second and particularly the final year you focus on specialist medical subjects such as the neurosciences, fundamentals of disease diagnostics and the molecular basis of inherited disease.

C741 Medical Biochemistry emphasises the importance of biochemistry in medicine, particularly in relation to understanding the molecular basis of disease and how this can lead to the development of novel therapeutic strategies. In addition to the biochemistry core courses, you take core courses in physiology, cell biology and genetics in the first year and the medically-orientated options in the second and final years. These include biochemical aspects of immunology and neurobiology, the molecular basis of inherited disease and embryology.

C701 Molecular Biology emphasizes the essence of the molecular mechanisms that control life processes. A common first year of core units is followed by a selection of optional and additional core courses in molecular biology (including applied aspects of the subject) and biochemistry. In the final year, students take advanced level courses that focus on molecular biology, cell biology, molecular and medical microbiology, human molecular genetics and inherited diseases.

You will also have a choice from a selection of final year projects in either biomedical, environmental, microbial or plant sciences in which molecular biology approaches are used.

ORGANISMAL BIOSCIENCE DEGREES

C100 Biology provides a comprehensive coverage of most aspects of biology ranging from the physiological to the ecological. A common first year builds the necessary foundation for more specialist courses in the second and third year. These can be selected to maintain a broad-based degree or to concentrate on areas which are predominantly ecological, physiological, or organismal.

C150 Ecology and the Environment is the study of interactions between plants and animals and their environments. A common first year provides the necessary foundation for a selection of second and third year courses which cover diverse aspects of ecology including both terrestrial and aquatic ecosystems, conservation and behavioural ecology.

C300 Zoology places particular emphasis on the study of animals. Following a common first year which provides basic training in organismal, ecological and physiological aspects of biology, a range of options is available in the second and third years, which cover the diversity and evolution of animals, their adaptations to different life styles and habitats, how they function and their behaviour.

1.2 Courses Offered – School of Biological Sciences RHUL

All first year courses and BS3010 are one unit value. All other courses are half unit value.

COURSE CODE	COURSE NAME	COORDINATOR
First Year		
BS1030 (1cu)	Principles of Molecular Bioscience	Dr J McEvoy
BS1040 (1cu)	The Diversity of Life	Dr D Morritt
BS1050 (1cu)	Ecology: Animal Behaviour to Environmental Conservation	Prof J Koricheva
BS1060 (1cu)	Living Systems: Animal and Plant Physiology	Dr J Beauchamp
BS1070 (1cu)	Cell Biology and Genetics	Dr P F Devlin
BS1090 (1cu)	Biochemistry: The Molecular Basis of Life	Dr W Lucchesi
Second Year		
BS2005	Microbiology	Dr S Dissanayeke
BS2010	Invertebrate Biology: Structure, Behaviour and Evolution	Prof M J F Brown
BS2020	Plant Life: from Genes to Environment	Dr E Lopez-Juez
BS2040	Cell Biology	Prof L Bögre
BS2050	Essential Human Physiology in Health and Disease	Dr J Beauchamp
BS2060	Developmental Biology	Dr E Lopez-Juez
BS2090	Insects, Plants and Fungi: Ecology and Applications	Prof A C Gange
BS2110	Practical Field Ecology	Prof J Koricheva
BS2120	Biological Data Analysis and Interpretation	Dr S Papworth
BS2140	Animal Behaviour	Dr S Portugal
BS2150	Applications of Molecular Genetics in Biology	Dr W Lucchesi
BS2160	Evolution	Dr F Ubeda de Torres
BS2001X	Marine Biology	Dr D Morritt
BS2510	Bioenergetics, Biosynthesis and Metabolic Regulation	Dr J McEvoy
BS2520	Protein, Structure and Function	Dr M Soloviev
BS2530	Molecular Biology	Dr C Wilkinson
BS2540	Molecular and Cellular Immunology	Dr W Lucchesi
BS2550	Neuronal Cell Signalling	Dr P Alifragis
BS2560	Pharmacology and Toxicology	Dr P E Chen
BS2570	Physical Biochemistry for Life Scientists	Dr M Soloviev
Third Year		
BS3010 (1cu)	Individual Research Project	Prof M J F Brown
BS3020	Special Study: Dissertation	Dr M Soloviev(Molecular) Prof V Jansen(Organismal)
BS3030	Biology of Parasitic Diseases	Dr J Tovar-Torres
BS3060	Conservation Biology	Dr S Papworth
BS3090	Entomology	Prof J Koricheva
BS3110	Mediterranean Island Conservation and Ecology	Prof M J F Brown
BS3120	Population and Community Ecology	Prof V Jansen
BS3160	Behavioural Ecology	Dr R Riesch
BS3180	Marine Ecology and Biodiversity	Dr D Morritt
BS3190	Climate Change: plants and the environment	Dr A Devoto
BS3510	Molecular and Medical Microbiology	Dr S Dissanayeke
BS3520	Seed Biology	Prof G Leubner
BS3530	Applications of Advanced Molecular Biology Methods	Prof R S Williams
BS3540	Cell & Molecular Biology of Cancer	Prof L Bögre
BS3560	Functional Genomics, Proteomics and Bioinformatics	Dr A Devoto
BS3570	Human Embryology and Endocrinology	Dr J Murdoch
BS3580	Cellular and Molecular Neuroscience	Dr P Alifragis
BS3590	Molecular Basis of Inherited Disease	Dr R Yáñez
BS3595	Clinical Physiology and Medicine	Dr J Murdoch
BS3600	Clinical Diagnosis of Disease	Prof P Sharma

1.3 Programme outlines

The programme structure for each of the seven degrees are summarised in the tables over the next few pages. The mandatory (core) courses are indicated as the shaded grey boxes; students must take these courses. Non-mandatory (optional) courses are indicated with the O. Students can select from the optional courses, to give a total of four Course Units for each year.

1.4 Progression conditions

The College regulations that are currently in place regarding Progression are that students who began their degree in 2015 are expected to pass all four course units to progress to the next stage of the programme. However, the Sub-Board of Examiners have the discretion to condone narrow fails (30-39%), up to a maximum of 1 course unit across stages 1 and 2, if the stage average is at least 40%. Students must pass at least three Course Units in the final stage of the programme, and achieve a final average of 35.00% or above, in order to graduate. Students are generally given two attempts to progress to the next stage. For failed courses, a second attempt may be given as the opportunity to take a resit of the exam, either at the end of the summer (late August, early September), or in May the following year. Alternatively, students may be given the opportunity to repeat a failed course in attendance. Summer resits are normally only offered to students who have failed to meet the requirements to progress by half or one course unit, and who would then be able to progress. The decision on which of these option(s) to give to students who do not progress is at the academic judgement of the Sub-Board of Examiners, who consider all students anonymously. Extenuating circumstances are considered in a separate pre-Sub-Board meeting, and recommendations from this meeting are fed into the Sub-Board meeting in order to be able to take action, if considered necessary.

1.5 Calculation of the final degree classification

Degrees at RHUL are awarded on the basis of the final average mark. At present, the final average is calculated as a 0 : 1 : 2 ratio of first : second : third year results. Therefore, first year results do not count towards the final degree outcome, but are important in underpinning the studies of second and third year.

Full details of the Undergraduate Regulations are available from the College website.

MOLECULAR BIOSCIENCE DEGREES 2016/17
First Year Course Combinations

For each degree programme, mandatory (shaded box) courses are listed. All courses are taught by the staff of the School of Biological Sciences as detailed in the corresponding course specification documents available in the School's website under https://www.royalholloway.ac.uk/biologicalsciences/informationforcurrentstudents/courseunits/home.aspx

Each year, students must complete the equivalent of four course units.

Course Units			Degree Programme			
			Biochemistry C700	**Medical Biochemistry C741**	**Molecular Biology C701**	**Biomedical Sciences B990**
BS1030	(1c.u.)	Principles of Molecular Bioscience				
BS1060	(1c.u.)	Living systems: Animal and Plant Physiology				
BS1070	(1c.u.)	Cell Biology and Genetics				
BS1090	(1c.u.)	Biochemistry: The Molecular Basis of Life				

MOLECULAR BIOSCIENCE DEGREES
Second Year Course Combinations – for 2016/17

The list of mandatory (core, grey shaded box) and non-mandatory (optional, O) courses available for each degree programme is given below. Mandatory courses must be completed in order to qualify for that degree programme. Each course counts as one half-unit. Students should choose sufficient optional courses to give a total of 8 half units for the year, including mandatory courses.

Course Unit		Term*	Biochemistry C700	Medical Biochemistry C741	Molecular Biology C701	Biomedical Sciences B990
BS2005	Microbiology	T2	O	O	O	O
BS2020	Plant Life: from Genes to Environment	T2	O		O	
BS2040	Cell Biology	T2	O	O		O
BS2050	Essential Human Physiology in Health and Disease	T1			O	
BS2060	Developmental Biology	T1	O	O	O	O
BS2150	Applications of Molecular Genetics in Biology	T1	O			
BS2160	Evolution	T1			O	
BS2510	Bioenergetics, Biosynthesis & Metabolic Regulation	T1&T2			O	O
BS2520	Protein Structure & Function	T1				
BS2530	Molecular Biology	T1&T2				
BS2540	Molecular and Cellular Immunology	T1&T2	O		O	
BS2550	Neuronal and Cellular Signalling	T1&T2	O		O	
BS2560	Pharmacology and Toxicology	T2	O	O		
BS2570	Physical Biochemistry for Life Scientists	T1				

* The Term in which the course runs is shown as a guide, based on the timetable in 2015-16; this may be subject to change for 2016-17.

MOLECULAR BIOSCIENCE DEGREES
Final Year Course Combinations – for 2016/17

The list of mandatory (core, grey shaded box) and non-mandatory (optional, O) courses for each degree programme is given below**.** Students on the Biochemistry Programme are expected to take 5 half course units of Biochemistry courses (BS35**, BS3010, BS3020) in their final year. Mandatory courses must be completed in order to qualify for that degree programme. Each course counts as one half-unit, apart from BS3010 which is a whole unit. The BS3010 Individual Research Project is non-condonable, and must be passed in order to graduate with that degree. Students should choose sufficient optional courses to give a total of 8 half units for the year, including core courses.

Course Unit		Term*	Biochemistry C700	Medical Biochemistry C741	Molecular Biology C701	Biomedical Sciences B990
BS3010	Individual Research Project (1 c.u.)					
BS3020	Special Study: Dissertation		O	O	O	O
BS3030	Biology of Parasitic Disease	T1	O	O	O	O
BS3190	Climate Change: Plants and the Environment	T2	O		O	
BS3510	Molecular and Medical Microbiology	T1 & T2	O	O	O	O
BS3520	Seed Biology: Molecular & Conservation Biology to Industrial Appns	T1	O		O	
BS3530	Applications of Advanced Molecular Biology Methods	T1 & T2	O	O		O
BS3540	Cell & Molecular Biology of Cancer	T1 & T2	O	O		O
BS3560	Proteomics, Genomics & Bioinformatics	T1 & T2				O
BS3570	Human Embryology and Endocrinology	T1 & T2	O		O	
BS3580	Cell & Molecular Neuroscience	T1 & T2	O		O	
BS3590	Molecular Basis of Inherited Disease	T1	O			
BS3595	Clinical Physiology and Medicine	T2				O
BS3600	Clinical Diagnosis of Disease	T2				

* The Term in which the course runs is shown as a guide, based on the timetable in 2015-16; this may be subject to change for 2016-17.

ORGANISMAL BIOSCIENCE DEGREES

First Year Course Combinations –2016/17

For each degree programme, mandatory (shaded box) courses are listed. All course specification documents are available in the School's website under https://www.royalholloway.ac.uk/biologicalsciences/informationforcurrentstudents/courseunits/home.aspx

Each year, students must complete the equivalent of four course units.

Mandatory courses: These must be completed in order to qualify for that degree programme.

Course Unit		Degree Programme		
		Biology C100	**Zoology C300**	**Ecology & the Environment C150**
BS1040	The Diversity of Life			
BS1050	Ecology: Animal Behaviour to Environmental Conservation			
BS1060	Living Systems: Animal and Plant Physiology			
BS1070	Cell Biology and Genetics			

ORGANISMAL BIOSCIENCE DEGREES
Second Year Course Combinations – for 2016/17

The list of mandatory (core, grey shaded box) and non-mandatory (optional, O) courses available for each degree programme is given below. Mandatory courses must be completed in order to qualify for that degree programme. Each course counts as one half-unit. Students should choose sufficient optional courses to give a total of 8 half units for the year, including mandatory courses.

Course Unit		Term*	Biology C100	Zoology C300	Ecology & the Environment C150
BS2005	Microbiology	T2	**O**	**O**	**O**
BS2010	Invertebrate Biology: Structure, Behaviour and Evolution	T1			
BS2020	Plant Life: From Genes to Environment	T2			
BS2040	Cell Biology	T2	**O**	**O**	
BS2050	Essential Human Physiology in Health and Disease	T1	**O**	**O**	
BS2060	Developmental Biology	T1	**O**	**O**	
BS2090	Insect, Plants and Fungi: Ecology & Applications	T2	**O**	**O**	
BS2110	Practical Field Ecology (Term 3 of first year)	T3 of Y1	**O**	**O**	
BS2120	Biological Data Analysis and Interpretation	T1			
BS2140	Animal Behaviour	T2	**O**		**O**
BS2150	Applications of Molecular Genetics in Biology	T1			**O**
BS2160	Evolution	T1?			
BS2001X	Marine Biology (summer vacation between Y2 and Y3)	summer	**O**	**O**	**O**
BS2530	Molecular Biology	T1&T2	**O**	**O**	
BS2540	Molecular and Cellular Immunology	T1&T2	**O**	**O**	

* The Term in which the course runs is shown as a guide, based on the timetable in 2015-16; this may be subject to change for 2016-17.

ORGANISMAL BIOSCIENCE DEGREES
Final Year Course Combinations – for 2016/17

The list of mandatory (core, grey shaded box) and non-mandatory (optional, O) courses for each degree programme is given below**.** Mandatory courses must be completed in order to qualify for that degree programme. Each course counts as one half-unit, apart from BS3010 which is a whole unit. The BS3010 Individual Research Project is non-condonable, and must be passed in order to graduate with that degree. Students should choose sufficient optional courses to give a total of 8 half units for the year, including core courses.

	Term*	Biology C100	Zoology C300	Ecology & the Environment C150
BS3010 Individual Research Project				
BS3020 Special Study: Dissertation		O	O	O
BS3030 Biology of Parasitic Diseases	T1		O	
BS3060 Conservation Biology	T2	O	O	O
BS3090 Entomology: Pure and Applied	T1	O	O	O
BS3110 Mediterranean Island Conservation and Ecology Field Course	T3 of Y2	O	O	O
BS3120 Population and Community Ecology	T1	O	O	
BS3160 Behavioural Ecology	T2	O		O
BS3180 Marine Ecology and Biodiversity	T2	O		
BS3190 Climate Change: plants and the environment	T2			
BS3520 Seed Biology: Molecular & Conservation Biology to Industrial Appns	T1	O		O
BS3510 Molecular and Medical Microbiology	T1 & T2	O		
BS3530 Applications of Advanced Molecular Biology Methods	T1 & T2	O	O	
BS3540 Cell & Molecular Biology of Cancer	T1 & T2	O	O	
BS3570 Human Embryology and Endocrinology	T1 & T2	O	O	
GG3017 Conservation Biogeography (subject to timetable compatibility)	T2			O
GG3046 Mammals in a Changing World (subject to timetable compatibility)	T1		O	

* The Term in which the course runs is shown as a guide, based on the timetable in 2015-16; this may be subject to change for 2016-17.

1.6 Course Unit Specifications and Pre-requisites for Second Year Courses

Please note that all timings are based on those for 2015-16. Timetables are subject to change and will only be confirmed by the College immediately prior to the start of the academic year. Course information is provided for courses in 2015-16 and is subject to minor amendment as part of the process of continuous improvement.

Course unit specifications can be found at:
http://www.rhul.ac.uk/biologicalsciences/informationforcurrentstudents/courseunits/home.aspx

SECOND YEAR COURSES

BS2005 – Microbiology – Dr S Dissanayeke
The course aims to introduce key concepts in microbiology, which encompasses studies in bacteria, viruses, and eukaryotic microbes. The historical milestones in this field of research will be considered, as well as the background of the important methodologies used in microbiology research. The course will include information on how microbes are classified, and how the different types of microbes are distinguished. We will discuss bacterial growth and differentiation, including genetic regulation. The course will explain the importance of microorganisms in health and disease, including human welfare issues such as opportunistic infections and the role of microorganisms in cancer. We will also consider how microorganisms can be used in research. This course is an essential prerequisite for the third year course BS3510 Molecular and Medical Microbiology.

Value - Half course unit
Suitable - 2nd year
Available - 2nd term
On - Tuesday
Prerequisites - BS1070

BS2010 – Invertebrate Biology: Structure, Behaviour and Evolution – Dr M J F Brown
The course involves a broad and in-depth study of the invertebrate phyla. The main focus will be on understanding body-plans, how structure relates to behaviour, and evolutionary relationships. The course will also examine invertebrate diversity and ecological importance. The practicals are an integral part of the course, and are designed to introduce techniques relevant to the study of invertebrates. These include experiments, dissection, microscopy, and preparation of whole mounts and staining sections for microscopical study.

Value - Half course unit
Suitable - 2nd year
Available - 1st term
On - Thursday
Prerequisites - None

BS2020 – Plant Life: from Genes to Environment – Dr E López-Juez
The course examines primarily the most advanced (flowering) plants, their

evolution, developmental and functional biology. In part one, the origin and diversification of flowering plants is discussed, as it is reflected in their reproductive biology. In the second part the 'building' of a plant is analysed, with reference to the meristems, pools of 'stem cells' in which it primarily takes place. Part three reviews mechanisms by which the photosynthetic apparatus adapts to current light conditions or to water/CO_2 availability. Part four examines some case studies of the role and mode of action of plant hormones. Part five reviews plant environmental sensors of abiotic and biotic factors, key to adapt plant development and behaviour to the prevailing conditions. The mode of action of such sensors, and the responses that they evoke, are discussed. Part six touches upon plants in the context of their domestication ("accelerated evolution") in the hands of humans and in relation to global environmental change, the impact it has on plants and of the role plants can play in reducing it.

Value - Half course unit
Suitable - 2nd year
Available - 2nd term
On - Monday
Prerequisites - BS1070

BS2040 – Cell Biology – Prof L Bögre

The course will focus on the following key areas of modern cell biology: cell cycle, cell growth and differentiation, apoptosis, cell senescence, cell polarity, cell shape and cell motility, organelle origin and functions. Will give theoretical knowledge in modern cell biology methods, including microscopy and live cell imaging. Will introduce basic concepts on evolutionary constrains in cellular functions and links between cellular functions and development.

Value - Half course unit
Suitable - 2nd year
Available - 2nd term
On - Tuesday
Prerequisites - BS1060

BS2050 – Essential Human Physiology in Health and Disease – Dr J Beauchamp

The course will focus on the functions and integration of selected human physiological systems and how these are disrupted by disease.
The endocrine system: The thyroid gland will be used to explain the role of the hypothalamo-pituitary axis, feedback loops and multi-system response; the stress response to illustrate endocrine and nervous system integration in long- and short-term physiological response. How hormonal and neural signals integrate to regulate gastrointestinal activity, secretion and transit to ensure efficient digestion, and then to maintain blood glucose homeostasis in the absorptive and postabsorptive states will be discussed.
Skeletal muscle: The specialised structure of the skeletal muscle cell and the molecular basis of contraction will be discussed, including excitation-contraction coupling, the role of Ca^{2+}, cross-bridge cycling, tetanic contraction and fibre types. Aspects of nerve/muscle communication including the neuromuscular junction, Golgi tendon organs and spindles will be covered, together with the significance of motor units and recruitment for whole muscle function.

Cardiovascular system: The structure and function of cardiac muscle will be covered together with aspects of cardiovascular physiology including cardiac output and the control of arterial pressure, together with cardiac failure, arrhythmia and cardiomyopathy. The composition blood will be discussed, including examples of blood disorders along with the haemostatic mechanisms that prevent blood loss following vessel damage.

The respiratory system: This topic will include respiratory surfaces and surfactant, the mechanics of respiration and gas exchange and the integration of respiration and cardiovascular output.

Value - Half course unit
Suitable - 2nd year
Available - 1st term
On - Monday
Prerequisites - BS1060

BS2060 – Developmental Biology – Dr E López-Juez

Multicellularity has allowed living things to achieve levels of complexity and sophistication impossible at the single cell level. This course will explore the mechanisms by which zygotes establish or make use of basic body plan axes, and how subsequent cellular differentiation and interaction is achieved and results in the variety of tissues and organs that build an animal body. The course will focus on model organisms in which both embryological and genetic approaches have been developed, and will explore axis establishment, segmentation, cellular differentiation, organ development, and the widely-shared signalling pathways that underpin them.

Value - Half course unit
Suitable - 2nd year
Available - 1st Term
On - Tuesday
Prerequisites - BS1060

BS2090 – Insects, Plants and Fungi: Ecology and Applications – Prof A C Gange

The course will cover the effects of herbivorous insects on plants and the ways in which plants defend themselves against attack. Beneficial effects such as pollination will also be addressed. The ecology of fungi pathogenic on insects and plants will be covered as well as fungi that are beneficial to plants (endophytes and mycorrhizas).

Value - Half course unit
Suitable - 2nd year
Available - 2nd term
On - Thursday
Prerequisites - None

BS2110 – Practical Field Ecology – Dr J Koricheva

The course covers the design and analysis of ecological experiments, including field sampling techniques. Emphasis will be placed on the difficulties of designing experiments in the field, compared to controlled conditions. Building on first year courses, it will provide an opportunity to design and perform simple investigations

into several different taxonomic groups such as mammals, invertebrates and plants. The practical work aims to teach skills such as identification using keys, field sampling, quantitative population estimation and the analysis of diversity.

Value - Half course unit
Suitable - 2nd year
Available - 3rd term of Year 1
On - 10 days in May 2016, after the examinations
Prerequisites - BS1050

BS2120 – Biological Data Analysis and Interpretation – Dr S Papworth

This course provides an introduction to the use of statistical methods in biological sciences. Emphasis is placed on understanding how questions in biology can be answered quantitatively using statistics. The most important and widely used descriptive, associative and comparative statistical tests are illustrated, especially how and when they can be used. Key concepts of statistical sampling and experimental design in biology are introduced. Exercises give students hands-on experience of using biostatistical techniques.

Value - Half course unit
Suitable - 2nd year
Available - 1st term
On - Wednesday
Prerequisites - None

BS2140 – Animal Behaviour – Dr S Portugal

The course demonstrates the great variety of animal behavior occurring across the range of animal taxa and in different ecological situations. The course outlines the major theories that seek to explain animal behaviour, such as kin selection, optimal foraging and game theory. In depth case studies will be used to illustrate the advantages of the main methods used to study animal behaviour, and how they can be applied to studying different types of behavioural questions.

Value - Half course unit
Suitable - 2nd year
Available - 2nd term
On - Friday
Prerequisites - None

BS2150 – Applications of Molecular Genetics in Biology – Dr W Lucchesi

This course outlines the molecular tools currently available for the exploration of genetic diversity in a range of organisms, and for the genetic manipulation of micro-organisms, plants, and animals, and describes how genetically modified, transgenic organisms can be produced by a variety of transformation methodologies. Examples of the application of molecular genetic strategies in basic biological and biomedical research and in areas as diverse as crop improvement, pest management, vaccine development, microbial evolution, human inherited disease and cancer are presented and discussed.

Value - Half course unit
Suitable - 2nd year
Available - 1st term

On - Friday
Prerequisites - BS1070

BS2160 – Evolution – Dr F Ubeda de Torres

Evolution is the study of how the genotypic and phenotypic compositions of populations change through time. This course covers the foundation of evolutionary biology and the mechanisms that have shaped organisms since life began. How the evolutionary synthesis came to be; the origin of variation; the allelic composition of a population and how different processes, including natural selection, modify this composition; and adaptation. These topics lead to considering how we can study evolution using phylogenetic methods. Finally, we consider the mechanisms of speciation and the special topic of human evolution.

Value - Half course unit
Suitable - 2nd year
Available - 1st term
On - Tuesday
Prerequisites - None

BS2001X (MB1) – Marine Biology – Dr D Morritt

The course exposes students, first-hand, to the broadest possible range of marine taxa, especially invertebrates, but including vertebrates and algae, sampled alive from their natural habitats. Practical work includes intertidal sampling (rocky shores and sandy shores) and sampling from a research vessel (plankton and subtidal benthos). The course considers behavioural, ecological and physiological aspects, morphological adaptations, systematic relationships and also the economic significance of selected groups. Students acquire skills in identification and the presentation of written work. Group project work will develop interpersonal skills, including organisation, leadership and oral presentation. The inclusion of an element of self-assessment will further foster critical abilities. Students are expected to cover their travel and accommodation costs (likely to be around £350, although costs are still to be confirmed).

Value - Half course unit
Suitable - 2nd year
Available - Late summer vacation between years 2 & 3 (counts as year 2 course). Course details subject to confirmation.
Prerequisites - BS2010

BS2510 – Bioenergetics, Biosynthesis and Metabolic Regulation – Dr J McEvoy

Basic bioenergetics and respiratory electron transport, including concepts of oxidative phosphorylation and chemiosmotic theory; proton-translocating ATPase; structure and function of the respiratory chain. *Biosynthetic pathways and their regulation*, covering sugar nucleotides, storage polysaccharides, amino sugars and glycoproteins; the regulation of carbohydrate metabolism (including caloric homeostasis); the distribution and biosynthesis of isoprenoids, cholesterol, lipids and fat soluble vitamins; protein prenylation and glycosylation.

Value - Half course unit
Suitable - 2nd year
Available -1st and 2nd terms
On -1st term; Thursday, 2nd term; Wednesday

Prerequisites - BS1090

BS2520 – Protein Structure and Function – Dr M Soloviev

The course covers the principles of protein structure, including secondary structure, motifs and domains, and protein folding *in vivo*. Methods for separation, purification, detection, structural and functional analysis of proteins are considered. The course also covers protein-protein interactions, and the principles of protein engineering and design, as well as the mechanisms of enzyme catalysis and regulation, with specific examples. The practical class will provide experience in using fundamental techniques in protein separation and analysis such as SDS-PAGE and Western blotting. The coursework also involves the structure and function prediction of an unknown protein sequence using bioinformatics tools

Value - Half course unit
Suitable - 2nd year
Available - 1st term
On - 1st term, Wednesday
Prerequisites - BS1090

BS2530 – Molecular Biology – Dr C Wilkinson

The course covers the physical and chemical structure of DNA, recombinant DNA technology, DNA replication, gene organisation and structure, RNA and protein synthesis. The laboratory experiments cover a range of molecular biology techniques based on the theme of gene characterisation. This course also includes sessions in numeracy for molecular biologists and statistical skills.

Value - Half course unit
Suitable - 2nd year
Available - 1st and 2nd term
On - Thursday and Friday
Prerequisites - BS1070 or BS1090

BS2540 – Molecular and Cellular Immunology – Dr W Lucchesi

This course examines the specific immune system at the molecular level, dealing with the structure and function of the soluble and cell surface proteins involved. Subjects include: the immune response and acquired immunity; antibody structure and function; antibody diversity and clonal selection; genetics of immunoglobulin expression; the complement system; antibody techniques; monoclonal antibodies hypersensitivity reactions (allergies); the activity of T cells; major histocompatibility complexes, their role in transplant rejection and non-self-recognition; and, HIV and AIDS.

Value - Half course unit
Suitable - 2nd or 3rd year
Available - 1st and 2nd term
On - 1st Term: Tuesday, 2nd Term: Wednesday
Prerequisites - BS1070

BS2550 – Neuronal and Cellular Signalling – Dr P Alifragis

This course covers the principles of signalling in the nervous system, including electrical signalling along neurons and synaptic transmission. Different types of

neurotransmitters will be considered and their receptors and intracellular signal transduction pathways will be studied. We will study the role and action of Acetylcholine, GABA and glutamate. The role of voltage-gated and ligand-gated ion channels will be discussed, including the role of potassium and calcium ion channels. The second term of the course will focus on central cell signalling pathways. Lectures will start with an introduction to drug development from and industrial and research perspective. The course will then cover the basis of cell signalling, from the outside of the cell (mebrane receptors) to key mechanisms of cell signalling. These will include kinase (and phosphatase) activity, the second messangers heterotrimeric G proteins and small GTPases, cAMP, and two important families of inositol-containing compounds and calcium. Example disease related signalling will be highlighted throughout. Finally the course will introduce a range of model systems for neuroscience research.

Value - Half course unit
Suitable - 2nd or 3rd year
Available - 1st and 2nd term
On - 1st term, Thursday; 2nd term, Friday
Prerequisites - BS1060 and BS1090

BS2560 – Pharmacology and Toxicology – Dr P E Chen

The course will cover the various aspects of drug action, their effect on normal physiology and their therapeutic applications. Topics covered include: drug-receptor interactions and the principal methods for receptor identification and characterisation, routes of administration of drugs, physico-chemical and physiological aspects of drug absorption and distribution, pathways of drug metabolism and excretion, renal clearance and ultra-filtration, mechanism of action of the major classes of analgesic and anti-depressant drugs, principles of toxicology and the major mechanisms of free radical induced tissue damage, pharmacology of the autonomic nervous system and the neuromuscular junction, general and local anaesthetic agents.

Value - Half course unit
Suitable - 2nd year
Available - 2nd term
On - Monday
Prerequisites - BS1030 and BS1060

BS2570 – Physical Biochemistry for Life Scientists – Dr M Soloviev

The course covers physical biochemistry methods applicable for studying the behaviour of macromolecules in solution. These include electronic spectroscopy methods such as fluorescence, phosphorescence and circular dichroism, mass spectrometry and its application to studies of biological macromolecules; MS, MS-MS, quantitative MS. Surface plasmon resonance interferometry, biocalorimetry, and scanning force microscopy and introduction to nanobiotechnology.

Value - Half course unit
Suitable - 2nd year
Available - 1st term
On - Monday
Prerequisites - BS1030

INFORMATION ABOUT THIRD YEAR COURSES

BS3010 – Individual Research Project – Prof M J F Brown

An individual wet or dry investigation, supervised by an appropriate member of staff, who will provide guidance both before starting and during the course of your work. The research will be carried out during the Summer (post-2nd year exams), Autumn and Spring terms. Students will attend a project training day after 2nd year exams. In addition, students are expected to attend the School Seminar Series (~15 1-hour seminars from external scientists), to gain a broader scientific context for the work and develop presentational skills, and 3rd year tutorials (5 x 1-hour sessions), which will enable them to maximise the value of the transferable skills gained from their project work and thus enhance their future career. The work is assessed by means of a report submitted either at the end of either the first or second term in the third year. Students will have been allocated to supervisors on the basis of the student's expressed research preferences, their 2nd year exam results and staff availability, and then research topics will be decided in consultation between the student and staff concerned before commencement of the project. In some cases students may have designed their own research project. Students will present a word-processed report (not exceeding 8,000 words exclusive of references) that will contribute 75% of the mark. 15% will be a continuous assessment mark awarded for performance by the supervisor. They will also give a 15 minute oral presentation on their project that will contribute 10% of the mark. Oral presentations will be given in Reading Week of Term 2 (for students who handed in projects at the end of Term 1) or the week after 3rd year exams (for all others).

Value - One course unit
Suitable - 3rd year
Available - Summer vacation after 2nd year and 1st term; or 1st and 2nd term, 3rd year
Prerequisites - As specified for individual projects in the BS3010 Handbook

BS3020 – Special Study: Dissertation – Dr M Soloviev/Prof V Jansen

A literature research project on a biological or biochemical topic of the student's choice, acceptable to the School of Biological Sciences. The resulting word-processed and bound report should be at least 5,000 but not more than 7,500 words, with some 20-40 references and appropriate figures or diagrams. Students will exercise and develop their skills in critically evaluating the recent scientific literature on a topic of their choice. The exploration of the literature will enable them to see the manner in which scientific understanding is advanced by obtaining data that is used to generate and test hypotheses. The student, in preparing a detailed written report, is presented with an opportunity to improve their presentational skills. The student's expert knowledge in the topic may be investigated in the form of a viva voce.

Value - Half course unit
Suitable - 3rd year
Available - 1st and 2nd term of 3rd year
Prerequisites - None, but subject choice must be appropriate to student's degree programme

BS3030 – Biology of Parasitic Diseases – Dr J Tovar-Torres

This course explores the principles of parasitism and the protective mechanisms employed by immuno-competent hosts to limit the spread of infection. It outlines the biological strategies used by a range of unicellular and multicellular organisms to colonise its host causing disease in human and non-human hosts. Case studies on the pathology and the cellular immunity elicited by various parasites are explored. The immune evasion strategies used by widely distributed human parasites to protect themselves from immune attack are also reviewed. The principles and prospects of anti-parasitic vaccination in the 21st century are presented and discussed.

Value - Half course unit
Suitable - 3rd year
Available - 1st term
On - Tuesday
Prerequisites - BS2150 or BS2530

BS3060 – Conservation Biology – Dr S Papworth

The course covers the biological basis of the great threats to biodiversity – habitat loss and fragmentation, intensive agriculture, over-harvesting and natural resource exploitation, alien species, disease and global climate change – and the approaches developed by conservation biologists to overcome these threats at local and global scales. The potential for subjectivity in conservation decision-making and the crucial importance of science-based conservation is stressed. Practical work is part of the assessment and involves writing an invasive species management plan.

Value - Half course unit
Suitable - 3rd year
Available - 2nd term
On - Friday
Prerequisites - BS1040

BS3090 – Entomology: Pure and Applied – Prof J Koricheva

The course aims to provide students with a sound understanding of insect biology, addressing aspects of their physiology and biology. Insects are the most numerous animals on the planet and the basic information will enable students to appreciate why this is so. Insects are of conservation importance and part of the course will focus on beneficial insects such as pollinators and saproxylic (dead wood feeding) species and focus on the reasons for their decline. The course also aims to introduce students to practitioners in entomology, showcasing research at the School, CABI and Rothamsted Research. The final aim of the course is to improve students' communication skills. Students will improve their verbal skills through the making of a podcast and their written skills through the production of an information leaflet for the general public.

Value - Half course unit
Suitable - 3rd year
Available - 1st term
On - Thursday

Prerequisites - BS2010

BS3110 – Mediterranean Island Conservation and Ecology Field Course – Prof M Brown

The course exposes students to the ecology of the Greek island of Samos, and the work of the main Greek conservation NGO (Archipelago). This will involve conservation ecology in marine and terrestrial ecosystems, with a focus on key species and habitats. Practical work includes (i) sea grass monitoring (using snorkelling), (ii) bird monitoring, (iii) plankton sampling, micro-plastic sampling and oceanography, on a research vessel, (iv) golden jackal monitoring (camera traps, playback techniques), (v) invertebrate monitoring (pollinator surveys, pitfall traps), (vi) chameleon monitoring (nocturnal surveys). On-site lectures underpin the practical sessions and the course considers behavioural, conservation, and ecological aspects, and the relationship of conservation to policy and local knowledge. Students acquire skills in identification, monitoring, research project development, oral presentations, and the presentation of written work. Group project work will develop interpersonal skills, including organisation, leadership and oral presentation. The inclusion of an element of self-assessment will further foster critical abilities. This course will involve a week-long trip to Samos. Estimated costs for the course are ~ £550 per student. Students are expected to cover their travel costs.

Value - Half course unit, counts as Y3 course
Suitable - 3rd year
Available - 3rd term of Y2
On - Last week of May/first week of June, after Y2 exams
Prerequisites - BS2110

BS3120 – Population and Community Ecology – Prof V Jansen

In the course the principles of population and community ecology are explained, using examples from animal and plant assemblages. It focuses on population growth, inter- and intra-specific competition, trophic relations and the factors which regulate populations. The ecological processes that contribute to community organisation, such as food web structure, body size, succession and natural disturbances are considered. The role of population and community ecology in the maintenance of biodiversity is emphasised. A proposal writing exercise and assignments, which will involve the use of computer simulations, are included.

Value - Half course unit
Suitable - 3rd year
Available - 1st term
On - Friday
Prerequisites - None

BS3160 – Behavioural Ecology – Dr R Riesch

The course demonstrates how the behaviour of animals can be explained in an ecological and evolutionary framework. The emphasis is upon functional and evolutionary hypotheses and testing models that seek to explain how animals find and use key resources (such as food, breeding territories, mates etc).

Value - Half course unit
Suitable - 3rd year

Available - 2nd term
On - Thursday
Prerequisites - BS2140

BS3180 – Marine Ecology and Biodiversity – Dr D Morritt

The course will begin with a brief introduction to the marine environment and oceanography. Following on from this a number of topical subjects will be used to illustrate recent developments in the field of marine ecology. The biodiversity and biogeography in the marine environment will be illustrated with reference to selected habitats, namely coral reefs and the deep ocean. The biology of the deep ocean, in particular the biology of mid-water and hydrothermal vent communities, will include consideration of technological advances in deep ocean exploration. This theme will be developed further in lectures on tracking studies, behaviour and conservation of marine megafauna, e.g sharks, sea birds and marine mammals. The topical issues of marine pollution (including plastics pollution), ocean acidification and global climate change will be considered with respect to effects on marine biodiversity. Topicality is also maintained during coursework: pairs of students prepare a poster based on a recently published paper from a highly rated marine biological journal.

Value - Half course unit
Suitable - 3rd year
Available - 2nd term
On - Wednesday
Prerequisites - Recommended: BS2001X (MB1)

BS3190 – Climate change: plants and the environment – Dr A Devoto

The course will give an advanced treatment of the effect of global climate change on the interaction between plants and the environment and will provide new opportunities to consider at various levels (ecological, physiological and molecular) the reaction of plants to environmental changes. Topics include a historical perspective on plants and humanity, microbial science and crop improvement.

Value - Half course unit
Suitable - 3rd Year
Available - 2nd Term
On - Tuesday
Prerequisites - BS1060

BS3510 – Molecular and Medical Microbiology – Dr S Dissanayeke

Advanced aspects in molecular microbiology with particular reference to bacteria and pathogenic eukaryotes. Topics include pathogen mechanisms for infection, the host immune response to infection, vaccine development, gastrointestinal health and disease, resistance to antibiotics, anti-parasite chemotherapy and the genetic and biochemical validation of parasite drug targets in the kinetoplastidae.

Value - Half course unit
Suitable - 3rd year
Available - 1st and 2nd terms
On - 1st term: Thursday, 2nd term: Friday
Prerequisites - BS1070, BS2005; plus BS2540 recommended

BS3520 – Seed Biology: From Molecular & Conservation Biology to Industrial Applications – Prof G Leubner

Plant seeds and fruits are of central importance to human existence as they constitute the beginning and the end of most food supply chains (food security and sustainability). They are the delivery systems of agricultural biotechnology and a cornerstone of ecosystem conservation (seed banking). Topics of the lectures include a solid introduction into the fundamental processes of seed development and food reserve deposition, germination and reserve mobilisation, as well as the utilisation of seeds for molecular pharming. The evolution of the seed habit and the biomolecular paleobotany of fossil seeds focus on the key advantages and diversity of seeds and fruits which evolved in interaction with climate change. The morphological diversity of seeds and fruits includes a one-day visit and practical at Kew's Millennium Seed Bank. This is followed by the biophysics of seed dispersal and the developmental biomechanics of seed fibres and seed germination. Further topics include a deeper insight into the molecular mechanisms underlying seed dormancy, germination and persistance in the soil bank, and their environmental control including by abiotic and biotic stress factors. The course also covers technologies used by the seed industry to improve crop seed quality and the resarch in agricultural biotechnology of wheat of Rothamsted Research at Harpenden. The lecture is complemented by course work in small groups on selected topics from the actual literature which is presented at the "seed conference". Websites: 'The Seed Biology Place' - www.seedbiology.eu, 'Kew's Millenium Seed Bank' - www.kew.org/science-conservation/save-a-seed-prosper/millenium-seed-bank/, 'Rothamsted Research' - www.rothamsted.ac.uk

Value - Half course unit
Suitable - 3rd Year
Available - 1st Term
On - Tuesday
Prerequisites - BS2020 or BS2150

BS3530 – Applications of Advanced Molecular Biology Methods – Prof R S Williams

Molecular biology research provides a key approach underpinning modern research that is employed in a wide range of systems including animal and plant models, as well as the simple social amoeba, *Dictyostelium*. This approach often employs the production and use of transgenic and knockout genetically modified organisms and the analysis of gene regulation and expression in response to the environment and in circadian rhythms. This course will describe these modern functional genomics studies, at an advance level, with particular reference to current research applications.

Value - Half course unit
Suitable - 3rd year
Available -1st and 2nd term
On -1st term: Thursday, 2nd term: Tuesday
Prerequisites - BS2530

BS3540 – Cell and Molecular Biology of Cancer – Prof L Bögre

This course will cover selected topics in molecular cell biology relevant to cancer, including: cell-cell adhesion and signalling; stem cells. We cover the importance of the cytoskeleton, including microtubule structure and their functional roles for cell division, cell cycle and polarity, cell dynamics and diseases. Additional topics on cancer biology include oncogenes, tumour suppressor genes and caretaker genes and the signalling and regulatory pathways these are involved in. The course covers the cellular, tissue and developmental barriers that have to be broken for the development of cancer. These will include apoptosis, senescence, angiogenesis and metastases. The course will also include case studies and novel research avenues for diagnosis and the rational treatment of cancer.

Value - Half course unit
Suitable - 3rd year
Available - 1st and 2nd term
On - 1st term: Tuesday, 2nd term: Monday
Prerequisites - BS1060 + BS2150 or BS2530

BS3560 –Functional Genomics, Proteomics and Bioinformatics – Dr A Devoto

The course will give an advanced treatment of structure-function relationships in proteins and of new opportunities for the use of genome-wide analyses in dissecting regulation in biological systems. Topics include, post-genomic science; modes of specific recognition in mediating protein interactions; domains and functions; and, protein engineering. Students complete a guided introduction to bioinformatics resources.

Value - Half course unit
Suitable - 3rd year
Available - 1st and 2nd terms
On - 1st term, Monday; 2nd term, Wednesday
Prerequisites - BS2520

BS3570 – Human Embryology and Endocrinology – Dr J Murdoch

This course will cover select aspects in the development of human embryos and the development and function of particular endocrine systems. Topics to be covered in detail include early embryonic development, including formation of the three cell layers during gastrulation and the specification of anterior-posterior and left-right axes. The formation and patterning of the brain and spinal cord will be discussed, including the cellular processes and molecular pathways involved. The effects of genetic and environmental insults in causing birth defects will be considered and the preventative action of folic acid treatment will be discussed. Techniques for deciphering the cause of birth defects will be considered, including the role of model organisms and the process of positional cloning. Other topics include the embryonic processes involved in craniofacial development and craniofacial defects. The development of the thyroid, parathyroid and adrenal glands will be covered, with detail on the synthesis, regulation and action of parathyroid and adrenocortical hormones. Sexual determination and differentiation will be discussed. Reproductive endocrinology will cover the regulation of reproductive function in males and females, including the hormonal changes associated with pregnancy. The processes of egg and sperm maturation and fertilization will be covered, leading us back to early preimplantation development.

This course is three quarters Embryology.

Value - Half course unit
Suitable - 3rd year
Available - 1st and 2nd term
On - 1st term: Wednesday, 2nd term: Friday
Prerequisites - BS2050 or BS2060 or BS2550

BS3580 – Cellular and Molecular Neuroscience – Dr P Alifragis

This course covers brain development, function and disorders. We discuss the cellular and molecular mechanisms of brain development with particular reference to the cerebral cortex. We discuss in detail the synthesis, storage and release of neurotransmitters. We will review the molecular basis of learning and memory. We will also study the cellular and molecular basis of brain disorders, including the neurodegenerative disorder, particularly Alzheimer's disease, as well as epilepsy and bipolar disorder. The course also includes lectures from a clinician, on the cellular and molecular basis of neuroprotection in preterm babies and infants.

Value - Half course unit
Suitable - 3rd year
Available - 1st and 2nd term
On - Wednesday (and Thursday for some lectures Term 2)
Prerequisites - BS2550

BS3590 – Molecular Basis of Inherited Disease – Dr R Yáñez

The course provides an introduction to the theory, technology, and clinical practice of human molecular genetics: the metabolic and molecular bases of human inherited disease, mapping disease genes, the human genome project, bioinformatics, clinical aspects of the biochemistry of inborn errors of metabolism, and therapeutic approaches. The course is taught in relation to a selected range of illustrative genetic disorders and inborn errors of metabolism such as muscular dystrophies, cystic fibrosis, haemophilia, lysosomal storage disorders, haemoglobinopathies, mitochondrial respiratory chain disorders, neurotransmitter synthesis disorders, lipoprotein diseases and primary immunodeficiencies. This course is taught primarily by external lecturers who are experts in the field.

Value - Half course unit
Suitable - 3rd year
Available - 1st term
On - Friday
Prerequisites - BS1070 and BS1090

BS3595 – Clinical Physiology and Medicine – Dr J Murdoch

This course will be taught by clinicians from Ashford and St Peter's Hospital, who are experts in their field and working at the patient interface. The course will therefore be taught from the clinical perspective, providing both background information on a topic but taking it through to consider common disorders, their causes and the medical treatments. The course will consider the clinical physiology of selected tissues, including smooth muscle, bone, cartilage and ligaments, and will set these tissues into context in terms of intestinal function, anorectal physiology, and the formation and function of bone and soft tissues. The lectures will consider some

common diseases and disorders, including pelvic floor defects, complications of child birth and colon cancer. Clinical problems with bone and soft tissue will be discussed, including disorders of calcium homeostasis, metabolic defects, and the effects of exercise, ageing and injury. The course will also address the physiological effects of shock, and the effects of stroke and neurological diseases. This course will also discuss how to scientifically evaluate new interventions or treatments, and students will learn how to critically appraise the "evidence" behind success claims.

Value - Half course unit
Suitable - 3rd year
Available - 2nd term
On - varies: Monday or Tuesday
Prerequisites - BS2050

BS3600 – Clinical Diagnosis of Disease – Prof P Sharma

The course will cover the clinical application of biochemistry and physiology. The chemical pathology of a range of physiological systems will be studied, including kidney, liver, heart, and thyroid. In addition clinical biochemical aspects of cancer diagnosis and infertility and epilepsy investigation will be covered. Lectures will concern the rationale behind the analyses used in the biochemical investigation of disease and the clinical aspects of disorders affecting the various organs/systems. The lectures will be followed by tutorials based on individual clinical cases and their investigation.

Value - Half course unit
Suitable - 3rd year
Available - 2nd term
On - Thursday
Prerequisites - Biomedical Sciences or Medical Biochemistry degree programmes only

Please note that course information is given as accurately as possible but is subject to change in the course of continual updating and review of courses.

1.7 Registration Process

Choice of course-units: Brief information about courses taught in the School are given above, and in the Undergraduate Handbook. More detailed information will be given in the Course specification for each individual course; these can be found at: http://www.rhul.ac.uk/biologicalsciences/informationforcurrentstudents/courseunits/home.aspx

Students should be aware that there are College thresholds for the minimum number of students required for a course to be taught and some courses can only accommodate limited numbers. After preliminary registration, if a course is over-subscribed or under-subscribed students will be notified as soon as possible and an alternative selection can then be made.
However, courses are only rarely undersubscribed.

Preliminary registration: In the second or third term, students must pre-register for the optional courses they intend to take the following academic year. Registration

for core courses is automatic. Pre-registration for suitable optional courses is done conveniently by email and full instructions are provided. Appropriate forms are completed and submitted as an attachment to SBSPre-registration@rhul.ac.uk .

Careful consideration to the requirements of individual Degree Programmes must be given (see summary tables above) before completing the appropriate forms. Students should consider courses which form coherent groups, and must check timetables for compatibility. Note that while every effort is made to avoid clashes, it is ultimately the student's responsibility to check the timetabling allows particular course combinations. Precise timetables for the next academic year will only be available at the beginning of the year, but existing timetables can be taken as a guide for the set-up that is likely to apply for the following year. Guidance on selection of courses is available from Personal Advisors and the Academic Coordinators for Molecular and Organismal Bioscience.

Registration: Confirmation of course registration occurs at the beginning of the relevant academic session. It is imperative that students see their Personal Advisor at the appointed time; the official College 'Course Entry Form' signed by the student at that time constitutes the basis for examination entries. Please note that the School makes every effort to retain course timetabling but that there may be unavoidable changes to the timetable over the summer vacation. Students should therefore check the timetables again carefully at the beginning of the academic year.

1.8 Course registrations

You can only register for four course units in each academic year (this excludes courses which are being resat). While you have the option of changing courses early in an academic term subject to agreement from the School, once you have submitted assessment for the course, you may not replace it with another either in that term or in a subsequent term (e.g. Spring term). Any courses that you wish to take on an extracurricular basis (that is, as extra and not counting towards your degree) must be identified at the start of the academic year or before any assessment has been completed for the course.

1.9 Change of Course Unit Registration

Students wishing to change any element of their course-unit registration, either to drop a course for another one, to delete a course or to register for an extra course, must see their Personal Advisor for this to be authorised. **You may not normally join a course after it has been taught for more than two weeks.** Your authorised change of course unit must be recorded in the School Teaching Office for examination entry amendment (please see the Faculty Administrator, Teaching, B504).

1.10 Change of Degree Programme

Students wishing to change their degree programme registration must:
a) see the appropriate Academic Coordinator to obtain approval.
b) obtain the necessary form from the Faculty Administrators which will have to be

signed by the Director of Teaching.

It is usually possible to change degree programmes during or at the end of first year of study where the first year is common to several programmes, but after the first year difficulties might arise because of the requirement to complete particular core course units for the award of each degree. Advice on changing degree programme should be obtained from your Personal Advisor in the first instance, or from the appropriate Academic Coordinator.