

School of Biology

Head of School

Professor K Sillar

Degree Programmes

Single Honours Degrees:

Animal Biology
 Behavioural & Environmental Biology
 Biochemistry
 Biology
 Biomolecular Science (with School of Chemistry)
 Cell Biology & Pathology
 Environmental Biology
 Evolutionary & Environmental Biology
 Human Biology
 Marine & Environmental Biology
 Neuroscience (with School of Psychology)
 Physiology
 Plant & Environmental Biology

Joint Honours Degree:

Biochemistry & Chemistry
 Environmental Biology and
 Geography or Geoscience

Major Degree Programmes:

Biology with French^W or German^W

^W available also as 'with Integrated Year Abroad Degrees'

Programme Prerequisites

Passes in BL1001 and BL1201 are normally required for entry to Single Honours Degrees; BL1002 is also required for programmes including Environmental Biology, and BL1004 is required for Human Biology.

Passes in, or exemptions from, BL1003 and BL2007 are required for entry to all Honours Biology Programmes.

Entry to the Honours programme is at the discretion of the Director of Teaching, but is automatically granted for students gaining at least grade 12 in two of the prerequisite second year modules. Those who, at their first attempt, earn a minimum aggregate of 35 grade points from their second year modules will also be considered for entry.

Prerequisite second year modules:

Single Honours:

Animal Biology: BL2001, AND one of BL2002 or BL2004 or BL2005

Behavioural & Environmental Biology: BL2001, AND BL2004 or BL2005

Biochemistry: Any TWO of BL2201, BL2202, BL2002 and BL2006

Biology: Any two biological second year modules.

Biomolecular Science: BL2201, BL2202, CH2101 and CH2103

Cell Biology & Pathology: Any TWO of BL2201, BL2202, BL2002 and BL2006
 Any TWO of BL2201, BL2202, BL2002 and BL2006

Environmental Biology: BL2001 or BL2003, AND BL2004 or BL2005

Evolutionary & Environmental Biology: BL2001 or BL2003, AND BL2005

Human Biology: BL2002 AND BL2006

Marine & Environmental Biology: BL2001 or BL2003, AND BL2004 or BL2005

Neuroscience: Any TWO of BL2201, BL2202, BL2002 and BL2006

Physiology: Any TWO of BL2201, BL2202, BL2002 and BL2006

Plant & Environmental Biology: BL2003, AND BL2004 or BL2005

Biology - pathways

BL3001; BL3002; BL3003; BL3004; BL3007; BL3008; BL3107; PS3008; PS3009; PS3055; PS3056; and *either* BL3200 or PS3050 plus PS3005.

Physiology

BL3001; BL3002; BL3003; BL3004; BL3007; BL3006 or BL3008 or BL3027; BL3107; BL3108; BL3106 or BL3109; BL3200; BL3300.

Plant & Environmental Biology

BL3000; BL3021; BL3022; BL3023; BL3024; BL3026; BL3027 or BL3006; BL3124; BL3125; BL3126; BL3200; BL3300.

Joint Honours

Minor Degree (with French or German)

BL3000, BL3200 and a further 120 credits taken from the groups defined for the Single Honours Degree subject to the permission of the Director of Teaching

Environmental Biology and Geography

BL3000; and any three of BL3021 – BL3027; and any two of BL3121 – BL3126; and BL3300; GG3018, and any two of GE3001 – GE3008, GG3011, plus 75 credits from GE3025 – GE3072 and/or GG3021 – GG3073, GG3082, GG3087, GG3089.

Environmental Biology and Geoscience

BL3000; BL3021; BL3022; BL3023; THREE from BL3121 – BL3126; GS3004; GS3005; GS3009; GS3010; and 60 credits from the group GG3023, GG3067, GG3068, GG3069, GG3082, GG3083, GG3084, GG3087, GG3088. In the case of students who spend part of the Honours Programme abroad on a recognised Exchange Scheme, the Programme Requirements will be amended to take into account courses taken while abroad.

With the permission of the Director of Teaching up to 20 credits may be taken in a module outwith the specified modules in the above Programmes.

Modules

BL1001 Cell Biology and Genetics

Credits: 20.0 Semester: 1

Description: This module provides an introduction to cell, molecular and developmental biology as well as genetics. The course starts by examining the components of a cell and how they are studied. After an introduction to molecular genetics, we continue with Mendelian, chromosomal and linkage genetics before considering how an organism develops from a single cell. An overview of molecular biology is followed by a discussion of energy generation in cells. Practicals centre on the use of microscopy in cell biology and development.

Class Hour: 10.00 am

Teaching: Four lectures, one seminar or tutorial and one 3 hour laboratory.

Assessment: Continuous Assessment = 50%, 2 Hour Examination = 50%

Re-Assessment: 2 Hour Examination and Oral if deemed necessary = 100%

BL1002 Biology of Organisms

Credits: 20.0 Semester: 2

Prerequisite: BL1001

Description: This module provides an introduction to basic systems; the evolutionary and whole organism biology of living plants and animals. It covers evolution and the taxonomy of organisms; the roles of plants as producers and animals as consumers in marine and terrestrial ecosystems; nutrient cycling and physiological processes in algae and flowering plants; invertebrates and vertebrates as consumers, including physiological and behavioural adaptations; origins and evolution of chordates and ultimately of man. Practical work on both plant and animal material is included with a variety of techniques.

Class Hour: 10.00 am

Teaching: Four lectures, one seminar or tutorial and one laboratory.

Assessment: Continuous Assessment = 50%, 2 Hour Examination = 50%

Joint Honours:

Biochemistry & Chemistry: BL2201, BL2202, CH2101, CH2103

Environmental Biology & Geography: BL2001 or BL2003, AND BL2004 or BL2005, AND GG2001 AND GG2002

Environmental Biology & Geoscience: BL2001 or BL2003, AND BL2004 or BL2005, AND GL2001 AND GL2002.

Programme Requirements

For all students already enrolled in the Honours Programme, please refer to the 1999-2000 Course Catalogue.

Where there are choices between modules in the programmes that follow, some options may have pre-requisites so that choices may be limited by the Pre-Honours modules taken.

Animal Biology

BL3001 or BL3021; BL3002 or BL3022; BL3003 or BL3023; BL3004; BL3025; BL3008 or BL3027; BL3104 or BL3107 or BL3121; BL3105 or BL3108 or BL3122 or BL3125; BL3109; BL3200; BL3300.

Behavioural & Environmental Biology

BL3000; BL3021; BL3022; BL3023; BL3004 or BL3024; BL3025; BL3027; BL3121 or BL3124; BL3122 or BL3125; BL3123 or BL3126; BL3200; BL3300.

Biochemistry

BL3001; BL3002; BL3003; BL3004; BL3005 or BL3007; BL3006; BL3101; BL3102; BL3103; BL3200; BL3300.

Biology

A free choice of modules as approved by the Degree Controller & Director of Teaching.

Biomolecular Science

BL3001; BL3002; BL3009; BL3010; BL3101; one of BL3102 or BL3103; BL3200; BL3300. CH3002; CH3004; CH3014; CH3106; CH3107; CH3109; CH3110; CH4026.

Cell Biology & Pathology

BL3001; BL3002; BL3003; BL3004; BL3005 or BL3007; BL3006 or BL3008; BL3104; BL3105; BL3103 or BL3106 or BL3109; BL3200; BL3300.

Environmental Biology

BL3000; BL3021; BL3022; BL3023; BL3024; BL3025 or BL3026; BL3027; BL3121 or BL3124; BL3122 or BL3125; BL3123 or BL3126; BL3200; BL3300.

Evolutionary & Environmental Biology

BL3000; BL3021; BL3002 or BL3022; BL3023; BL3024; BL3025 or BL3026; BL3027 or BL3008; BL3124; BL3125; BL3109 or BL3126; BL3200; BL3300.

Human Biology

BL3001 or BL3021; BL3002; BL3003 or BL3023; BL3004 or BL3024; BL3005 or BL3007 or BL3025 or BL3026; BL3008; BL3104 or BL3107; BL3102 or BL3105 or BL3108; BL3106 or BL3109; BL3200; BL3300. Must include at least ONE of BL3107 or BL3108.

Marine & Environmental Biology

BL3000; BL3021; BL3022; BL3023; BL3025; BL3026; BL3027; BL3121; BL3122; BL3123; BL3200; BL3300.

Neuroscience

Biology - 1000 Level modules

Class Hour: 11.00 am
Teaching: Five lectures and at least 3 hours of laboratories per week and four tutorials during the semester.
Assessment: Continuous Assessment = 50%, 3 Hour Examination = 50%
Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2002 Cell Physiology

Credits: 30.0 Semester: 1
Prerequisite: BL1001

Description: This module provides a basic introduction to physiology and histology, and concentrates on the inter-relationship between cell structure and cell function. Topics include: the cell as a physiological unit, homeostasis and the control of intracellular environment, the origin of the resting potential, the action potential, neural and synaptic transmission, cell growth factors and cell population dynamics, haematopoiesis and the immune system, introductory neurophysiology and neuroanatomy, structure and function of muscle, molecular endocrinology. The practical work will include experimental studies and computer simulations.

Class Hour: 9.00 am
Teaching: Five lectures and an average of 3 hours of laboratory.
Assessment: Continuous Assessment = 50%, 3 Hour Examination = 50%
Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2003 Plant Function and Diversity

Credits: 30.0 Semester: 1
Prerequisite: BL1001

Description: This module will introduce plant biology, with especial emphasis on diversity and physiology of plants. It is suitable for students who wish to pursue Marine Biology, Environmental Biology or Plant Biology options to Honours. Topics include: diversity and ecology of algae; bryophytes; the rise of the seed habit and origins of diversity in plants; reproductive and pollination biology; distribution of past and present day plant communities; physiology of photosynthesis, nutrient metabolism and control of growth and differentiation.

Class Hour: 12.00 noon.
Teaching: Five lectures and at least 3 hours of laboratory per week, and four tutorials per semester.
Assessment: Continuous Assessment = 50%, 3 Hour Examination = 50%
Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2004 Comparative Biology

Credits: 30.0 Semester: 2
Prerequisite: BL1001

Description: This module will cover the design and functioning of all multicellular organisms as a series of comparative sub-units encouraging a wide understanding of how organisms work and how they interact. This will include studies of support, locomotion and scaling; coordination by nervous systems and chemical signals; development, reproduction and life cycles; environmental adaptation; and animal and plant associations. Each sub-unit will cover a wide range of both invertebrate and vertebrate animals, plus the major groups of multicellular plants.

Class Hour: 12.00 noon.
Teaching: Five lectures and one 3 hour laboratory per week and fortnightly seminars and tutorials.
Assessment: Continuous Assessment = 50%, 3 Hour Examination = 50%

Re-Assessment: 2 Hour Examination and Oral if deemed necessary = 100%

BL1003 Quantitative Methods in Biology

Credits: 5.0 Semester: 2

Anti-requisite: Any MT1000 level module

Description: The aim of the module is to teach and reinforce the understanding and use of basic quantitative skills in a biological context as a preparation for Honours courses in the School of Biology. Topics covered include: (i) manipulation of equations, measurement errors and accuracy, straight lines and proportional relationships in biology; (ii) using index notation to describe exponential growth, numbers in standard form; (iii) representing and measuring change in biology; (iv) the use of logarithms in biology (exponential growth, handling large and small numbers, pH); (v) more curved line relationships in biology (the allometric, quadratic and rectangular hyperbola); (vi) basic statistics (presentation of data, statistical descriptors, estimation from a sample, confidence intervals, hypothesis testing). All topics involve developing calculator skills and graphing techniques.

Class Hour: To be arranged.

Teaching: Self-teaching workbook and six tutorials.

Assessment: Multiple Choice Test = 100%, test available in semester 2. Passing the test (or exemption from it) is a pre-requisite for entry into Honours Biology.

Re-Assessment: Repeats of Multiple Choice Test = 100%

BL1004 Human Biology

Credits: 20.0 Semester: 1

Description: This module gives a broad-based introduction to the varied fields of study which relate to Human Biology. It covers our evolution as a species, the basic structure and functions of our bodies, the ways in which we survive on this planet, the organisms which use us for their own survival, and the ways in which we think, communicate, reproduce and eventually die. This module is designed to be accessible to students with or without a background in biology.

Class Hour: 9.00 am

Teaching: Four lectures and one seminar/tutorial.

Assessment: Continuous Assessment = 50%, 2 Hour Written Examination = 50%

Re-Assessment: 2 Hour Examination and Oral Examination if deemed necessary = 100%

BL1201 Molecular Biology

Credits: 20.0 Semester: 2

Prerequisites: CH1001 or BL1001

Description: This module will introduce students to the molecular concepts and techniques that have revolutionised biology in the last few decades. It forms a valuable basis for all branches of modern biology, and for biological chemistry. It includes an introduction to the structure and function of proteins and enzymes, the molecular basis of genetics, DNA cloning and its application to biotechnology and human genetics, a brief introduction to molecular immunology and microbiology, and the molecular basis of cancer.

Class Hour: 9.00 am

Teaching: Four lectures and one 3 hour laboratory and fortnightly seminars or tutorials.

Assessment: Continuous Assessment = 50%, 2 Hour Examination = 50%

Re-Assessment: 2 Hour Examination and Oral if deemed necessary = 100%

BL2001 Animal Diversity

Credits: 30.0 Semester: 1

Prerequisite: BL1001

Description: This module provides an introduction to animal biology and diversity, and is suitable for students interested in environmental topics or animal biology. The module begins with a brief introduction to animal design, and the development of differing body plans, then a look at the lowest animal groups and the great diversity of 'worms', molluscs and annelids and their successful strategies, outshone by the huge radiation of arthropod groups. Lowly relatives of vertebrates and the origins and evolutions of the true vertebrates are considered. Emphasis throughout is on design, adaptation and evolution, and the relationships between different groups of animals.

Biology - 2000 Level modules

Credits: 30.0 Semester: 1

Prerequisites: CH1001, CH1004 and BL1201

Description: This module is an essential preparation for entry to Honours classes in Biochemistry and builds on the First Level Molecular Biology module, taking a more chemical and quantitative approach to biochemical science. The syllabus consolidates and extends the work of the First Level Molecular Biology module's treatment of mammalian metabolism, its integration and control, and will extend, in comparative approach, to microbial and plant systems.

Class Hour: 10.00 am

Teaching: Four lectures, one 3 hour laboratory and weekly seminars and tutorials.

Assessment: Continuous Assessment = 40%, 3 Hour Examination = 60%

Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2202 Applied Biochemistry

Credits: 30.0 Semester: 2

Prerequisites: BL2201

Description: This module, for which the Second Level Biochemistry module would be the normal prerequisite, emphasises applied aspects of biochemistry and molecular biology. Coverage includes medical biochemistry, with emphasis on neurochemistry, toxicology and clinical enzymology, together with a firm foundation in microbiology and biotechnology.

Class Hour: 10.00 am

Teaching: Four lectures, one 3 hour laboratory and weekly seminars and tutorials.

Assessment: Continuous Assessment = 40%, 3 Hour Examination = 60%

Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2401 Sport & Exercise Science

Credits: 30.0 Semester: 2

Availability: 2001-02

Description: This module leads the student towards an understanding of how the human body functions in an exercise and sports context. The structure and function of the major body systems are examined in relation to the following topics: the value of exercise to health; fitness and its acquisition; the principles of training; acquiring motor skills; environmental influences on performance; physical conditioning for sport and exercise; diet and nutrition for sport. Students contemplating opting for this module should have an interest in sport and exercise and they will be required to participate in laboratory practicals involving exercise.

Class Hour: 11.00 am

Teaching: Four lectures and one laboratory, and four tutorials during the semester.

Assessment: Continuous Assessment = 50%, 3 Hour Examination = 50%

Re-Assessment: 3 Hour Examination and oral if deemed necessary = 100%

The prerequisite for each of the following Honours modules is entry to the Honours Programme(s) for which they are specified, save where a specific prerequisite is given.

BL3000 Field Course

Credits: 5.0 Semester: summer vacation

Co-requisite: BL3021

Anti-requisite: BE3699

Description: This module involves field-based exercises in a range of aquatic and/or terrestrial habitats. Students will examine and measure biodiversity, ecophysiological adaptation, and community structure, with both plant and animal material. Class exercises are used to develop good sampling techniques and to generate and analyse large data sets. Students also work in small project groups to develop individual skills in experimental design, practical manipulations, time-management and personal initiative, and in verbal/written presentation of project results.

Class Hour: One week residential course

Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2005 Evolutionary Biology

Credits: 30.0 Semester: 2

Prerequisites: BL1001

Description: This module will introduce students to evolutionary biology; theory and history; mechanisms of heredity, change and adaptation; population dynamics; speciation and biodiversity. Topics covered will include the history of evolutionary ideas; mechanisms of inheritance of simple and complex characters; mutation and genetic variability; fitness, adaptation and natural selection; population genetics; modes of reproduction; diversity within and among species; evolutionary trends; phylogeny and taxonomy; molecular evolution and evolutionary ecology.

Class Hour: 11.00 am

Teaching: Five lectures each week, one tutorial or one 3 hour laboratory each week.

Assessment: Continuous Assessment = 50%, 3 Hour Examination = 50%

Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2006 Human Systems Physiology

Credits: 30.0 Semester: 2

Prerequisites: BL1001 and BL2002

Description: This module will describe the function and integration of the physiological systems of the human body. It will include: special senses, vision, hearing, taste and smell; the cardiovascular system; the hormones and enzymes of the gastrointestinal tract; the reproductive system; the hormonal control of reproduction; the contraceptive pill; the urinary system; the respiratory system, lung mechanisms and gas exchange, exercise physiology, training, energetics and fatigue.

Class Hour: 9.00 am

Teaching: Five lectures and an average 3 hours of laboratories a week.

Assessment: Continuous Assessment = 50%, 3 Hour Examination = 50%

Re-Assessment: 3 Hour Examination and Oral if deemed necessary = 100%

BL2007 Statistics for Biologists

Credits: 5.0 Semester: 1

Prerequisite: BL1003

Description: The aim of the module is to provide an understanding of statistical analysis and the application of tests to biological data. The module is a foundation for Honours courses in the School of Biology. Topics covered include: (i) experimental design; (ii) types of data, data distribution and the use of descriptive statistics; (iii) inferential statistics, using data from samples to make predictions about populations, confidence intervals; (iv) the concept of hypothesis testing; (v) tests for comparing samples (t-test, paired t-test, ANOVA, Mann-Whitney, Wilcoxon, Kruskal-Wallis, chi-square) and for describing relationships between variables (Pearson and Spearman correlations, linear regression); (vi) the analysis of power and error in tests. All topics involve the use of computers.

Class Hour: To be arranged.

Teaching: Eight seminars/lectures, self-teaching computer based interactive workbook, supported by tutorials.

Assessment: Multiple choice test = 50%, Problem based test = 50%. Passing the test is a prerequisite for entry into Honours Biology and re-assessment is acceptable.

Re-Assessment: Repeats of Multiple choice test = 50%, Problem based test = 50%

BL2201 Biochemistry

Biology - 3000 Level modules

de-sensitisation of signal responses and receptor 'cross-talk'; (v) direct and indirect activation of plasma membrane ion channels; (vi) nuclear receptors and the regulation of gene expression. The practical component includes experiments to illustrate methods used to elucidate signalling pathways as well as providing training in laboratory and transferable skills. Continuous assessment of this component will contribute 25% of the credit for the module.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3004 Neuroscience

Credits: 20.0

Semester: 2 (beginning)

Anti-requisite: BM3005

Description: This module covers biochemical, cellular and behavioural aspects of the nervous system. It starts with the basic biochemistry of neural membrane proteins such as receptors and channels, and considers the cellular mechanisms of action potential generation and propagation, and synaptic transmission. The physiology of sensory perception is illustrated by examining the visual system, while motor control is considered in terms of vertebrate locomotion. Selected aspects of learning and memory processes are examined from simple invertebrate systems through to the higher primates. Students are given extensive hands-on experience of computer simulation as a learning tool in this course. The associated practical work illustrates the lecture course through experiments on the nerve impulse, sensory processes, and the biochemistry of synaptic transmission.

Class Hour: Weeks 1 - 4, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3005 Molecular Virology

Credits: 20.0

Semester: 2 (middle)

Anti-requisite: BM3213

Description: Viral diseases remain a major public health threat, both in developed and developing countries. The world wide AIDS pandemic is but one example of a newly emerged virus disease; other potential threats come from EBOLA and Lassa Fever viruses. Older more established human viruses such as influenza, measles, hepatitis and the common cold still cause major health problems. Furthermore, prions, which are unconventional infectious agents that cause CJD, BSE and scrapie, are of major concern in both agricultural industries and human health. In this module, the harm and actual/potential benefits of viruses to man will be discussed. Different replication strategies employed by viruses will be explored and used to illustrate how viruses are classified. The module will also investigate the molecular basis of selected virus-induced diseases. For example, the abilities of specific viruses to establish persistent/latent infections, and to induce cancer, will be illustrated. The ways in which the immune response controls virus infections will be described, as will mechanisms that selected viruses have evolved to circumvent these immune responses.

Class Hour: Weeks 4 - 7, To be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3006 Bioenergetics

Credits: 20.0

Semester: 2 (end)

Prerequisite: Either BL2201 or BL3001

Anti-requisite: BM3007

Description: Energy transduction (Bioenergetics) is at the centre of all life, and involves the conversion of one form of energy into another by a biochemical process. The bioenergetics module describes the biological systems for harvesting light energy and conserving chemical energy from food and for the conversion of redox energy into the chemical energy in pyrophosphate bonds of ATP. The module also considers the energetics of transport and motor processes and the effects on the cell of the failure of energy generation. Chemiosmotic theory and principles are considered in detail as are the structure and function of electron and proton transfer systems of respiratory and photosynthetic systems. Practical classes will introduce the student to the methods used in this field study.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: 40-50 hours including up to 35 hours of lectures and seminars, and practicals.

Assessment: Continuous Assessment =100%

BL3001 Protein Function

Credits: 20.0 Semester: 1 (beginning)

Anti-requisite: BM3001

Description: This module builds on the material covered in BL1201 to provide an understanding of more advanced aspects of protein structure and enzymology. The module begins by considering protein conformation and the mechanisms of protein folding, both intrinsic and under the influence of natural catalysts. The behaviour of microtubules is used to illustrate the range of properties which emerge as a consequence of the assembly of proteins into large complexes while a study of the molecular and submolecular basis of protein function focuses on the mechanisms of proteolytic enzymes. This in turn leads into the phenomena of allosteric regulation, signalling cascades and transporter systems and is followed by a consideration of enzymes as pharmacological target design. The module includes an introduction to computer techniques for the display and examination of protein structure and to Bioinformatics for mining the information in protein and nucleic acid sequence databases. There is also an introduction to the use of electronic information resources. The associated laboratory course introduces the fundamentals of safe laboratory practice. It provides a grounding in the basic laboratory techniques, including associated calculations, as well as those associated with the study of proteins and enzymes.

Class Hour: Weeks 1 - 4, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3002 Molecular Genetics & Immunology

Credits: 20.0 Semester: 1 (middle)

Anti-requisites: BM3002 & BM3221

Description: This module covers topics at the interface of cell biology, genetics and molecular disease and provides a link to other modules dealing with gene expression, cell structure, developmental biology and cellular pathology. It first considers the composition of genomes and the major types of repeat sequences. The structures and properties of DNA are then briefly examined. Further topics include: genetic activity in relation to changes in chromatin structure and the assembly of nucleoprotein complexes during gene transcription, RNA processing, ribosome biogenesis and translation of messenger RNA. Finally, mechanisms for the nucleocytoplasmic transport of RNA and protein molecules are presented. The immunology component begins with an overview of the scope of immunity, the derivation of immunological memory, the nature of antigenicity and the role of the complement system. It then examines the structure, function and genetics of components of major importance, such as the immunoglobulins, Class I and II major histocompatibility complex proteins and T-cell receptors. The production and importance of monoclonal antibodies and recent developments in the area of applied immunology are considered.

Class Hour: Weeks 4 - 7, To be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3003 Membranes & Cell Communication

Credits: 20.0 Semester: 1 (end)

Anti-requisite: BM3003

Description: This module deals with the structural and functional organisation of biological membranes. The dynamic molecular components of biological membranes are studied by investigating the mechanisms involved in the control of membrane fluidity, the measurement of membrane fluidity and the biogenesis of new molecular components of the membrane. The central role that biological membranes play in the regulation of the movement of molecules between different extracellular, intracellular and transcellular compartments is also considered. The process of molecular transport is studied at both a theoretical and practical level. The interaction between the structural and functional organisation of the cell membrane is highlighted by studying the specialisation seen in the major transporting epithelial tissues. Topics covered include: (i) structural and kinetic analysis of ligand-receptor interactions; (ii) GTP-binding proteins and the generation of intracellular second messengers: cyclic AMP, cyclic GMP, diacyl glycerol and inositol triphosphate; (iii) the activation of receptor and intracellular protein kinases: serine/threonine and tyrosine kinases; (iv)

Biology - 3000 Level modules

Selected aspects of neurochemical disorders will be presented, including mechanisms of neurodegeneration, molecular aspects of drug abuse, and mood disorders.

Class Hour: Weeks 1 - 4, to be arranged.

Teaching: Ten lectures and four hours of tutorials/seminars and 12 hours practical.

Assessment: Continuous Assessment = 34%, 2 Hour Examination = 66%

BL3010 Basic Bioenergetics

Credits: 10.0 Semester: 2 (end)

Availability: Available only to non-graduating students

Prerequisite: Any basic biochemistry course (equivalent to BL2201)

Anti-requisites: BL3006, BM3104

Description: Energy transduction is essential for all cells. This module explores the structure and function of electron transport systems, chemiosmotic theory, mechanisms of ATP synthesis, and ion transport. Web-based resources provide a wider experience of recent advances.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: Fifteen lectures and five hours of tutorials/seminars.

Assessment: Continuous Assessment = 34%, 2 Hour Examination = 66%

BL3021 Terrestrial Environments

Credits: 20.0 Semester: 1 (beginning)

Co-requisite: BL3000

Anti-requisite: BE3001

Description: This module first considers the history of life on land, and major extinctions and radiation. Then it reviews the major biomes and their current distribution. There is a detailed consideration of the physical and chemical problems inherent to life on land, before moving on to cover the physiological, ecological, behavioural and life-history strategies for coping with these problems, across invertebrate and vertebrate groups. Similar consideration is given to strategies in land plants. Then the module considers the problems of coping with extremes; life in deserts, in polar regions and at altitude. Finally it covers the causes of anthropogenic environmental change, and the effects on terrestrial organisms: in particular, global warming, acidification, ozone depletion and polluting waste accumulation in the 21st century.

Class Hour: To be arranged.

Teaching: 40-50 hours, including up to 35 hours lectures and seminars, and practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3022 Marine & Freshwater Environments

Credits: 20.0 Semester: 1 (middle)

Prerequisites: BL3020, BL3021

Anti-requisite: BE3001

Description: This module introduces the biology of aquatic systems beginning with a description of the varying physical conditions that are inherent in marine, estuarine, lentic and lotic systems. Case studies will then be used to introduce the ecology of a variety of aquatic systems including tropical, temperate and polar systems. Examples will include a range of contrasting environments such as rivers, lakes and lochs, intertidal shores, coral reefs, mangrove systems and Antarctic sea-ice microbial communities. In conclusion, the influence of global climate variation and the close coupling between land and sea will be emphasised.

Class Hour: To be arranged.

Teaching: 40-50 hours, including up to 35 hours lectures and seminars, and practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3007 Pharmacology

Credits: 20.0 Semester: 2 (middle)

Anti-requisite: BM3006

Description: This module assumes that students are familiar with the material covered in BL2002 and BL2006. The basic principles of pharmacology will be covered, including evidence to support the modern concept that drugs act via specific receptors present on target tissues and an explanation of our present understanding of laws governing drug-receptor interactions. The concept of agonists, competitive and non-competitive antagonists and the interactions between such classes of drugs will be discussed. The effects of drugs upon the peripheral and central nervous systems and the cardio-vascular system will be covered. How these drugs can be used to understand the function of these systems and to correct their malfunctioning in various disease states will be explained.

The practical component will cover the principles of drug action and receptor theory and illustrate the use of bioassays in pharmacological investigations. The practicals aim to help students build a working knowledge of drug names and actions as well as pharmacological concepts. Continuous assessment of this component will contribute 25% of the credit for the module.

Class Hour: Weeks 4 - 7, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3008 Human Reproduction & Development

Credits: 20.0 Semester: 2 (end)

Anti-requisite: BM3004

Description: This multidisciplinary module uses the reproductive system as an exemplar to show how different methodological approaches can provide an integrated understanding of human reproduction. The module will develop concepts which draw upon recent advances in developmental biology, physiological control mechanisms mediated by the endocrine and nervous systems, pharmacology, immunology and anatomy including histology and medical imaging. The human reproductive system provides examples of simple and complex feedback control mechanisms, the role of environmental factors, applied endocrinology, pathology and ethical issues.

The practical element will build upon the information base and concepts developed in lectures and tutorials and will cover a number of practical approaches. Continuous assessment of this component will contribute 25% of the credit for the module.

Class Hour: Weeks 8 - 11, to be arranged

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3009 Neurochemistry

Credits: 10.0 Semester: 2 (beginning)

Prerequisite: Entry to the BSc programme in Biomolecular Science

Anti-requisites: BL3004 & BM3105

Description: This module uses computer-based, self-learning programmes, lectures, workshops and practical work to explore the biochemistry of neural communication. Topics covered include: the various essential proteins (e.g., transporters, pumps, and channels) found in the neuronal plasma membrane; signal transduction mechanisms; the molecular events involved in neurotransmitter release; the biosynthesis of various classes of neurotransmitters.

Biology - 3000 Level modules

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3023 Evolution

Credits: 20.0 Semester: 1 (end)

Anti-requisite: BE3002

Description: Topics in this module will include: molecular variation and evolution, including phylogeny reconstruction; the evolution and maintenance of sex; the genetics of continuous traits, and the relative importance of continuous and discontinuous variation in evolution; evolution of population genetic structure; the genetics of speciation, covering the evolution of pre- and post-zygotic isolation, reproductive displacement and reinforcement, and parapatric, sympatric and island speciation. Practicals will involve computer simulations to investigate a range of evolutionary phenomena, plus use of molecular markers to examine population structure and speciation.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3024 Biodiversity

Credits: 20.0 Semester: 2 (beginning)

Prerequisite: BL3021

Anti-requisite: BE3005

Description: This module covers the theoretical foundation for addressing the practical problems of ecology and biodiversity. Basic concepts of population ecology are addressed, such as predation and competition. Then the nature and measurement of biodiversity are considered. Further topics include island biogeography; community dynamics; and the role of spatial and temporal variation in ecosystems. Examples will be drawn from marine, freshwater and terrestrial ecology. There will be site visits and simple computer modelling sessions.

Class Hour: Weeks 1 - 4, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3025 Behavioural Ecology

Credits: 20.0 Semester: 2 (middle)

Anti-requisite: BE3004

Description: This module covers the behaviour of individuals: foraging and optimality theory, orientation and navigation, and rhythmic behaviours. Then it considers the behaviour of animals in groups: animal communication and alarm signals, social behaviour and kinship. We consider game theory and evolutionarily stable strategies as useful concepts in understanding behaviour. Finally we deal with reproductive behaviour, mating strategies, sexual selection and sexual conflict. Practicals will involve some project work and some laboratory sessions.

Class Hour: Weeks 4 - 7, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3026 Sustainable Development

Credits: 20.0 Semester: 2 (middle)

Anti-requisite: BE3006

Description: This module will demonstrate how theoretical ecological concepts can be applied to practical problems of resource management. The concepts of sustainable development and the precautionary principle are introduced; further topics then include the wise use of biological resources; the design and management of protected areas; impacts of genetically engineered organisms; and the conflicts between conservation and development. There is special consideration of sustainability in marine fisheries and modern aquaculture. There will be site visits, role playing sessions, case study analyses, and computer modelling.

Class Hour: Weeks 4 - 7, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3027 Environmental Physiology

Credits: 20.0 Semester: 2 (end)

Anti-requisite: BE3003

Description: This module deals with how animals cope with extremes of scale, environment, and life history, using responses to such extremes as a means to understand the physiology and evolution of a wide range of physiological mechanisms. There will be a brief review of underlying physical constraints and physiological principles, then topics considered will include metabolic and mechanical power generation, the mechanics and energetics of different modes of locomotion, altered metabolic states (sleep, torpor and hibernation), and how animals in the marine and terrestrial worlds cope with environmental variations in temperature, water flux, oxygen availability and pressure.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3101 Structural Biology and Bioinformatics

Credits: 20.0 Semester: 1 (beginning)

Anti-requisites: BM3211 & BM3212

Description: This module will introduce the students to the basic concepts and motifs of structural biology and the methods used to determine structure. The programme will integrate structure and bioinformatics through use of proteomics software and databases. The applications of techniques such as X-ray crystallography and NMR in the determination of the structure of proteins, carbohydrates and nucleic acids will be described. The practical components will include demonstrations of techniques used in structure solution and extensive computer and web based structural analyses, and familiarisation with proteomics software, databases and structure modelling packages.

Class Hour: To be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3102 Metabolic & Clinical Biochemistry

Credits: 20.0 Semester: 1 (middle)

Anti-requisite: BM3317

Description: The module presents an integrated review of overall human metabolism and the methods of diagnosing and treating some common diseases. The syllabus includes: (i) a review of human metabolism and its control; (ii) overall body energy expenditure and nutritional requirements; (iii) processing of dietary constituents; (iv) metabolic changes associated with starvation, obesity and exercise, and their underlying hormonal controls and regulatory systems; (v) discussion of the role of biochemistry in investigating and monitoring human disease, which will include metabolic variability, inborn errors of metabolism, endocrinology, homeostasis, plasma protein metabolism, muscle and hepatic metabolism, drug disposition and metabolism, and defects in glucose and lipid metabolism. Practical classes and laboratory visits to Ninewells Hospital will be incorporated into the course.

Class Hour: Weeks, 4 - 7, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3103 Gene Expression and Biotechnology

Credits: 20.0 Semester: 1 (end)

Prerequisite: BL3002

Anti-requisites: BM3002 & BM3212

Description: This module will investigate how organisms control the flow of information from gene to protein in response to metabolic, cell cycle and developmental signals. Initially the 'simpler' systems that bacteria have developed to control gene expression will be examined. Recent structural analysis has revealed the molecular basis for the action of these elements. Control of higher eukaryotic transcription will be investigated at the levels of nucleoprotein-complex assembly and changes in chromatin structure. Specific systems where control mechanisms have been elucidated will be investigated.

Class Hour: To be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

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Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3104 Cytoskeleton

Credits: 20.0 Semester: 1 (beginning)

Anti-requisite: BM3221

Description: This module deals with the structure, function and assembly of the three main types of cytoskeleton arrays (those largely constructed from microtubules, actin filaments or intermediate filaments). Topics usually include: microtubule-organising centres, centrosomes, centrioles, motor proteins, ciliary and flagellar beating, mitotic spindle assembly, anaphase chromosome movement, axoplasmic transport, cytoplasmic streaming, cleavage furrow formation, nuclear lamins, formation of focal adhesions, and the roles of actin and myosin in muscle and non-muscle cells. There will be emphasis on the dynamic properties of the cytoskeleton studied in living cells using novel gene constructs, and on functional interactions between the three major cytoskeletal elements. High resolution light and electron microscopy, confocal laser scanning microscopy, multi-photon microscopy, and immunofluorescence microscopy contribute substantially to the understanding of cytoskeletal organisation. Instruction in the theory and practice of modern microscopical techniques is an especial feature of this module.

Class Hour: To be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3105 General Pathology

Credits: 20.0 Semester: 1 (middle)

Anti-requisite: BM3222

Description: The module is divided into four main sections. In the first dealing with inflammation, the body's response to injury will be considered. In the second, aspects of vascular pathology will be considered including atheroma and its contribution to other vascular disorders. The third section will focus on immunopathology and its relevance to allergy or to immunity, immunodeficiency and transplantation. In the final section on tumours, the properties and pathology of tumours will be considered, including the causes of tumours. The multi-step process of carcinogenesis and the importance of cancer genes, tumour suppressor genes and genetic predisposition to cancer will be described.

Practical sessions will illustrate aspects of histopathology and gross pathology. Students will also undertake a range of experiments which will complement the topics covered in the module. Practical sessions are organised to enable the students to discuss the design of experiments, the analysis of data and the interpretation of results. Students will also produce a poster and present their practical work in a symposium. Continuous assessment of this component will contribute 25% of the credit for the module.

Class Hour: Weeks 4 - 7, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3106 Experimental Pathology

Credits: 20.0 Semester: 1 (end)

Anti-requisite: BM3223

Description: This module will consist of three sections. In the first, cell kinetics and proliferation regulation will be considered. An overview of the structure and organisation of cell renewal in normal tissues will be considered along with the relevance of growth factors in regulatory control. In the second section, this will focus on the haematopoietic tissues, looking at the techniques of studying stem cell and progenitor cell populations and the regulation of blood cell production including an understanding of changes occurring in leukaemia. In the final section, responses of the body to cell damage, in particular by radiation, will be considered. This will include cell responses to injury by physical and cytotoxic agents, mechanisms of DNA damage, cellular damage, and chromosomal damage. The kinetics and mechanisms of repair will be discussed in relation to genetic disorders, mutagenesis and carcinogenesis.

Students will undertake a range of experiments which will complement the topics covered in the module. Practical sessions are organised to enable the students to discuss the design of experiments, the analysis of data and the interpretation of results. Students will also produce a poster and present their practical work in a symposium. Continuous assessment of this component will contribute 25% of the credit for the module.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3107 Neural & Endocrine Physiology

Credits: 20.0 Semester: 1 (beginning)

Anti-requisite: BM3231

Description: The module includes endocrinology and neurophysiology. Special emphasis is given to acute and chronic homeostatic mechanisms under the control of the endocrine and nervous systems. The normal functioning of some hormonal systems is covered in depth and then consideration is given to the pathophysiology of selected diseases. Neural topics covered include sensory physiology, neurodegenerative diseases, and the development of vertebrate axons and their connections.

Practicals will be used to supplement the lecture component of the module. Topics may include Glucose Tolerance, Immunocytochemistry, and Apoptosis.

Class Hour: Weeks 1 - 4, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3108 Systems Physiology

Credits: 20.0 Semester: 1 (middle)

Anti-requisite: BM3232

Description: This module includes lectures on renal, gastrointestinal, cardiovascular and respiratory physiology. The physiology of muscle and exercise may also be covered. The normal functioning of these systems is considered in detail, and consideration is then given to the pathophysiology of selected disease states. The physiological bases of modern therapeutic strategies are discussed where appropriate.

The practicals will supplement the lecture component of the module. The practicals may involve a range of non-invasive procedures carried out on the class, on living experimental animals and/or on animal derived tissues. Different practicals will introduce a variety of experimental techniques, which in some cases may involve lengthy laboratory sessions.

Class Hour: Weeks 4 - 7, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3109 Development and Genes

Credits: 20.0 Semester: 1 (end)

Anti-requisites: BM3020 & BM3014

Description: The enigma of development is how complexity arises from apparent simplicity - how an adult develops from an egg. This module will examine development in a range of organisms, but will concentrate on higher vertebrates including man, and the fruitfly *Drosophila*, which have served as the models from which key discoveries are emerging very rapidly. Early-acting mechanisms for generating mutual differences between initially identical cell populations, and thus producing patterning and structure in embryos, will be considered. The evolutionary conservation of developmental mechanisms will be reviewed. Recent advances in the use of transgenic animals for investigating development will be considered, and the molecular genetics of human development and human abnormalities are discussed. Practical will include tissue culture, morphogenesis and work on early vertebrate development.

Class Hour: To be arranged.

Teaching: 40-50 contact hours, including up to 35 hours of lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

Biology - 3000 Level modules

BL3121 Marine Biology

Credits: 20.0 Semester: 1 (beginning)
Prerequisite: BL3022
Anti-requisite: BE3102

Description: This module addresses selected aspects of the biology of marine invertebrates and fish throughout the World Ocean from shallow water to the deep sea. Complementary to assessments of the ecology of particular benthic communities - their structure, dynamics and emergent properties - will be overviews of global patterns of diversity in the marine biosphere. Adaptation of invertebrates to environmental challenges, such as salinity fluctuations, will be considered in an ecophysiological context as will the environmental control of reproductive activity and chemical communication between individuals. The module concludes with appraisals of marine invertebrate reproductive strategies and the biology, settlement and metamorphosis of pelagic larval forms.

Class Hour: Weeks 1 - 4, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, and practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3122 Marine Mammal Biology

Credits: 20.0 Semester: 1 (middle)
Availability: 2001-02

Description: The study of marine mammals involves concepts and processes from the molecular level up through population and ecosystem levels of organization. This module will present current knowledge of marine mammal biology and the methodologies used in its study. Topics will include the range of species, their general biology, methods for studying individuals and populations, physiological and behavioural adaptations to the marine environment, ecology and interactions with man. The emphasis will be on areas of study where advances in knowledge are most rapid and on areas of current concern for marine mammal populations.

Class Hour: To be arranged.

Teaching: 40-50 hours, including up to 35 hours lectures and seminars, and practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3123 Marine and Environmental Microbiology

Credits: 20.0 Semester: 1 (end)
Anti-requisite: BE3104

Description: This module begins with a survey of the features and distribution of microorganisms in marine and freshwaters, sediments and soils, including the deep sea and other extreme environments, stressing sampling methods, culture, enumeration and biomass determination. The role of microorganisms in the ecology of natural environments (especially decomposition, nutrient cycling, and marine fouling) is considered. Lectures are also given on particular marine topics, especially the principle diseases of fish and shellfish, the microbiology of petroleum, and bacteriological aspects of sewage pollution in seas.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, plus practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3124 Evolutionary Ecology

Credits: 20.0 Semester: 1 (beginning)
Availability: 2001-02
Prerequisite: BL3023

Description: This module will address advanced topics in evolutionary biology. The focus will be on experimental approaches to the study of evolution in the laboratory as well as in the field. Emphasis will be placed on experimental conception and design, and on analysis of data addressing evolutionary topics. These will include sexual selection, breeding system evolution, population structure and geographic divergence, and phenotypic evolution. Recent advances in genomic analysis and bioinformatics and their application to interpretation of evolution will also be considered.

Class Hour: Weeks 1 - 4, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars, and practicals.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3125 Animal-Plant Interactions

Credits:	20.0	Semester:	1 (middle)
Prerequisite:	BL3021		
Anti-requisite:	BE3103		

Description: This module concerns the coevolution of plants and animals, including physiological, behavioural and ecological aspects of their interactions. Pollination biology and the constraints on the participating plants and animals are dealt with in depth, followed by a review of seed dispersal. Then herbivory by insects and by vertebrates on land, and aquatic herbivory, are considered; illustrating the coevolution of plant defences and herbivores' reciprocal adaptations. There is an introduction to insects as pests, to tritrophic interactions, and integrated approaches to control measures.

Class Hour: Weeks 4 - 7, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3126 Applied Plant Physiology & Biotechnology

Credits:	20.0	Semester:	1 (end)
Prerequisites:	BL2003		
Anti-requisite:	BE3101		

Description: This module considers fundamental aspects of plant stress responses to the environment, including light, water, temperature, nutrients, salinity, and toxic soils. It then considers how this knowledge may be used in conventional and biotechnological approaches for the improvement of plant quality and productivity. The use of plant cell and microbial cultures in the generation of novel products, e.g. drugs and dyes, is discussed. There will be industrial visits and contributions from industry and research institutes.

Class Hour: Weeks 8 - 11, to be arranged.

Teaching: 40-50 contact hours, including up to 35 hours lectures and seminars.

Assessment: Continuous Assessment = 34%, 3 Hour Examination = 66%

BL3200 Research Project

Credits:	45.0	Semester:	Whole Year
Anti-requisites:	BE3106 & BM3905		

Description: This project will involve the study of a defined problem within the area of environmental and evolutionary biology, appropriate to the degree programme being studied by each student. This will involve an understanding of the design of experiments; the gathering, collation and analysis of data; and the discussion of results, on their own and in the light of existing literature. The project will be written up in the form of a research dissertation.

Assessment: Continuous Assessment = 100%

BL3300 Recent Advances

Credits:	15.0	Semester:	Whole Year
Anti-requisites:	BE3105 & BM3906		

Description: This module encourages awareness of recent developments throughout environmental and evolutionary biology, particularly from topics introduced in a series of seminars. It requires students to demonstrate their ability to evaluate and integrate recent advances into structured essays, showing understanding of the significance of the research rather than expertise with technical details, and an ability to transfer or integrate information among research fields. It also encourages an informed opinion where areas are controversial or particularly uncertain. The subject matter for the essays is to come from general reading outwith taught modules, as well as from seminars attended.

Class Hour: 12.00 noon Wednesday, seminars (green); various (red).

Assessment: 3 Hour Examination = 100%

