School of Biology

Important Degree Information:

B.Sc./M.A. Honours
The general requirements are 480 credits over a period of normally 4 years (and not more than 5 years) or part-time equivalent; the final two years being an approved honours programme of 240 credits, of which 90 credits are at 4000-level and at least a further 120 credits at 3000- and/or 4000-levels. Refer to the appropriate Faculty regulations for lists of subjects recognised as qualifying towards either a B.Sc. or a M.A. degree.

B.Sc./M.A. Honours with Integrated Year Abroad
The general requirements are 540 credits over a period of normally 5 years (and not more than 6 years) or part-time equivalent; the final three years being an approved honours programme of 300 credits, of which 60 credits are gained during the integrated year abroad, 90 credits are at 4000 level and at least a further 120 credits at 3000 and/or 4000 levels. Refer to the appropriate Faculty regulations for lists of subjects recognised as qualifying towards either a B.Sc. or M.A. degree.

Other Information: 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 per programme may be taken in a module outwith the specified modules in the above 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 11 in two of the prerequisite second year modules. Those who, at their first attempt, earn a minimum aggregate of 35 grade points from 2000-level Biology modules will also be considered for entry. 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.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Animal Biology** **(Not available to entrants after 2005/6)**	**Single Honours Animal Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1201 and BL1002. **Level 2:**. At least 60 credits including BL2102 and BL2106. **Level 3:** 120 - 125 credits comprising BL3307; BL4127; BL3306 or BL3309; BL3313 or BL3316; BL3317; BL3315 or BL3318. BL3000 is also required if BL3308 or BL3309 is taken. *Prior to 2006/7: 120 - 125 credits comprising BL3001 or BL3021; BL3002 or BL3022; BL3003 or BL3023; BL3004; BL3025; BL3008 or BL3027. BL3000 is also required if BL3021 is taken, and both of these are required if BL3022 is taken.* **Level 4:** 120 credits comprising BL4112 or BL4107 or BL4122; BL4108 or BL4121or BL4127; BL4109 or BL4125; BL4200 and BL4300.
(B.Sc. Honours): **Behavioural Biology** **(Only available to students who began their programme in 2004/5 or later)**	**Single Honours Behavioural Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** at least 60 credits including BL2102 and BL2105. **Level 3:** 120-125 credits comprising BL3307; BL4127; BL3303 or BL3306 or BL3309; BL3313 or BL3316; BL3317; BL3315 or BL3318. BL3000 is also required if BL3308 is taken. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3022; BL3023; BL3004 or BL3024; BL3025 and BL3027.* **Level 4:** 120 credits comprising BL4122 or BL4124; BL4127; BL4123 or BL4125; BL4200 and BL4300. Students may take no more than 2 modules from BL4121; BL4122 and BL4123.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Behavioural & Environmental Biology** **(Not available to entrants after 2005/6)**	**Single Honours Behavioural & Environmental Biology B.Sc. Degree:** **Level 1:** 60 credits including passes in BL1001; BL1002 and BL1201. **Level 2:** At least 60 credits including BL2102 and BL2105 **Level 3:** 120-125 credits comprising BL3307; BL4127; BL3303 or BL3306 or BL3309; BL3313 or BL3316; BL3317; BL3315 or BL3318. BL3000 is also required if BL3308 is taken. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3022; BL3023; BL3004 or BL3024; BL3025 and BL3027.* **Level 4:** 120 credits comprising BL4122 or BL4124; BL4127; BL4123 or BL4125; BL4200 and BL4300. Students may take no more than 2 modules from BL4121; BL4122 and BL4123.
(B.Sc. Honours): **Biochemistry**	**Single Honours Biochemistry Degree:** **Level 1:** 40 credits comprising passes in BL1001 and BL1201. BL1002 is also recommended for all students considering Honours Programmes in the School of Biology. **Level 2:** At least 60 credits including BL2101 and BL2104. **Level 3:** 120 credits comprising BL3301; BL3302; BL3303; BL3310 or BL3313; BL3311 and BL3312. *Prior to 2006/7: 120 credits comprising BL3001; BL3002; BL3003; BL3004 or BL3102; BL3005 or BL3007; BL3006.* **Level 4:** 120 credits comprising BL4101; BL4102; BL4103; BL4200 and BL4300.
(B.Sc. Honours): **Biology**	**Single Honours Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** At least 60 credits from 2000-level modules available in the School of Biology **Level 3:** 120-125 credits comprising a free choice of modules as approved by the Degree Controller & Director of Teaching. Students on this programme are expected to study across a wide range of sub-disciplines within Biology. BL3000 is required if BL3308 or BL3309 is taken. *Prior to 2006/7: 120-125 credits comprising a free choice of modules as approved by the Degree Controller & Director of Teaching. BL3000 is required if BL3021 is taken, and both are required if BL3022 is taken.* **Level 4:** 120 credits comprising a free choice of modules as approved by the Degree Controller & Director of Teaching, but including BL4200 and BL4300. No more than 2 modules from BL4121; BL4122 and BL4123.
(B.Sc. Honours): **Biology and Economics**	**Biology element Joint Honours Biology and Economics Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201 **Level 2:** 60 credits including any two 2000-level Biology modules with a grade 11 pass in each. **Level 3:** 60 credits from modules BL3301-BL3318, 20 credits will normally be taken in Semester 1 and 40 credits in Semester 2. BL3000 is required if BL3308 or BL3309 is taken. *Prior to 2006/7: 60 credits from modules BL3000-BL3102, 20 credits will normally be taken in Semester 1 and 40 credits in Semester 2.* **Level 4:** 60 credits from any Semester 1 4000-level Biology modules.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Biology and Psychology**	**Joint Honours Biology and Psychology Degree:** **Level 1:** 80 credits comprising passes in BL1001, BL1002, BL1004 and BL1201, AND 40 credits comprising passes in PS1001 and PS1002 **Level 2:** 60 credits comprising passes in BL2102 and BL2105, AND 60 credits comprising passes in PS2001 and PS2002 **Level 3:** 120 credits chosen from: BL3309, BL3313, BL3317, BL4127, (PS3006 or PS3012), PS3008, PS3010, PS3021, PS3011, PS3022 **Level 4:** 120 credits chosen from: Appropriate SH modules in Biology, still under review. PS4064, PS4065, PS4066, PS4071, PS4075 AND to include Research Project in either School, by agreement with Directors of Teaching.
(B.Sc. Honours): **Biology with French^ or German^ or Spanish^** ^also available as 'with Integrated Year Abroad Degrees'	**Biology element of Major Degree with French or German:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** .60 credits from the 2000-level modules available in the School of Biology. **Levels 3 & 4:** 180 credits. Typically 80 credits at 3000-level and 100 credits at 4000-level. BL3000 is required if BL3308 or BL3309 is taken. BL4200 and a further 135 credits taken from the groups defined for a Single Honours Degree subject to the permission of the Director of Teaching. *Prior to 2006/7: If BL3021 or any modules in the range BL4121 to B4129 are chosen, then BL3000 is normally also required.*
(B.Sc. Honours): **Biomolecular Science (note admission to this degree is via the School of Chemistry)**	**Biomolecular Science (B.Sc. Honours):** **Level 1:** Biology Element: 40 credits including passes in BL1001 and BL1201. Chemistry Element: 20 – 40 credits comprising pass or bypass for CH1001, pass in CH1004 **Level 2:** (120 credits including BL2101, BL2104 and CH2101 and CH2103) or (125 credits comprising BL2007 and passes at 11 or better in BI2201, BI2202, CH2101 and CH2103) **Level 3:** 120 credits comprising Biology Element: BL3301 or BL3302; BL3310; and BL3312, and further modules as specified by the School of Chemistry. *Prior to 2006/7: 120 credits comprising Biology Element: BL3001; BL3002; BL3009; BL3010 and* *Chemistry Element: CH3611, CH3612, CH3613, CH3621, CH3432, CH4613* **Level 4:** 120 credits comprising two of (BL4101, BL4102, BL4103), two of (CH4511, CH4611, CH4612) and either (BL4200 and BL4300) or [BL4200, CH5614 and one of (CH5411, CH5511, CH5612)] or [CH4442, CH5614 and one of (CH5411, CH5513, CH5612)] Chemistry: Direct entry into Level 2000 is possible, in which case 120 advanced standing credits at level 1000 are given. 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.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Cell Biology** **(Only available to students who began their programme in 2004/5 or later)**	**Single Honours Cell Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201 **Level 2:** at least 60 credits including BL2101 and BL2104. **Level 3:** 120 credits comprising BL3301; BL3302; BL3303; BL3310 or BL3313; BL3311; BL3312 or BL3315. *Prior to 2006/7: 120 credits comprising BL3001; BL3002; BL3003; BL3004 or BL3102; BL3005 or BL3007; BL3006 or BL3008.* **Level 4:** 120 credits comprising BL4112; BL4108; BL4103 or BL4109; BL4200; BL4300.
(B.Sc. Honours): **Cell Biology & Pathology** **(Not available to entrants after 2005/6)**	**Single Honours Cell Biology & Pathology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201 **Level 2:** At least 60 credits including BL2101 and BL2104 **Level 3:** 120 credits comprising BL3301; BL3302; BL3303; BL3310 or BL3313; BL3311; BL3312 or BL3315. *Prior to 2006/7: 120 credits comprising BL3001; BL3002; BL3003; BL3004 or BL3102; BL3005 or BL3007; BL3006 or BL3008.* **Level 4:** 120 credits comprising BL4112; BL4108; BL4103 or BL4109; BL4200 and BL4300.
(B.Sc. Honours): **Ecology & Conservation** **(Only available to students who began their programme in 2004/5 or later)**	**Single Honours Ecology & Conservation Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** at least 60 credits including BL2103 and BL2105. **Level 3:** 120 credits including BL3000; BL3307; BL3308; BL3309; BL3316; BL3317 and BL3318. *Prior to 2006/7: 120 credits including BL3021; BL3022; BL3023; BL3024; BL3025 and BL3027.* **Level 4:** 120 credits including BL4124; BL4121 or BL4129; BL4123 or BL4125; BL4200 and BL4300.
(B.Sc. Honours): **Environmental Biology** **(Not available to entrants after 2005/6)**	**Single Honours Environmental Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1201 and BL1002. **Level 2:** At least 60 credits including BL2103 and BL2105. **Level 3:** 125 credits comprising BL3000; BL3307; BL3308; BL3306 or BL3309 ; BL3316; BL3317 and BL3318. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3022; BL3023; BL3024; BL3025 and BL3027.* **Level 4:** 120 credits comprising BL4124; BL4121 or BL4129; BL4123 or BL4125; BL4200 and BL4300.
(B.Sc. Honours): **Environmental Biology & Geography**	**Environmental Biology element of Geography Joint Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** 60 credits including BL2102 or BL2103; and BL2105. **Level 3:** 65 credits comprising BL3000; and any three of BL3307, BL3308, BL3306, BL3309, BL3316, BL3317 or BL3318.*Prior to 2006/7: 65 credits comprising BL3000; and any three of BL3021 to BL3027* **Level 4:** 55 - 60 credits comprising i) any two of BL4121 to BL4129; and BL4300 OR ii) three from BL4121 to BL4129

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Environmental Biology & Environmental Geoscience or Geoscience**	**Environmental Biology of Geoscience Joint Degrees:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** 60 credits including BL2102 or BL2103; and BL2105 **Level 3:** 65 credits comprising BL3000; BL3307; BL3308; BL3306 or BL3309. *Prior to 2006/7: 65 credits comprising BL3000; BL3021; BL3022 and BL3023* **Level 4:** 55 - 60 credits comprising i) any two of BL4121 to BL4129; and BL4300 OR ii) three from BL4121 to BL4129
(B.Sc. Honours): **Evolutionary Biology** **(Only available to students who began their programme in 2004/5 or later)**	**Single Honours Evolutionary Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** At least 60 credits including BL2103 and BL2105. **Level 3:** 125 credits comprising BL3000; BL3307; BL4127 or BL3308; BL3006 or BL3309; BL3316; BL3317; BL3315 or BL3318. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3002 or BL3022; BL3023; BL3024; BL3025; BL3027 or BL3008.* **Level 4:** 120 credits comprising BL4124; BL4121 or BL4129; BL4103 (if BL3002 was taken) or BL4109 or BL4125; BL4200 and BL4300.
(B.Sc. Honours): **Evolutionary & Environmental Biology** **(Not available to entrants after 2005/6)**	**Single Honours Evolutionary & Environmental Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** At least 60 credits including BL2103 and BL2105. **Level 3:** 125 credits comprising BL3000; BL3307; BL4127 or BL3308; BL3309; BL3316; BL3317; BL3315 or BL3318. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3002 or BL3022; BL3023; BL3024; BL3025; BL3027 or BL3008.* **Level 4:** 120 credits comprising BL4124; BL4121 or BL4129; BL4103 (if BL3002 was taken) or BL4109 or BL4125; BL4200 and BL4300.
(B.Sc. Honours): **Human Biology**	**Single Honours Human Biology Degree:** **Level 1:** 60 credits including passes in BL1001; BL1201, and BL1002. Students without Higher or A-level Biology should also take BL1004. **Level 2:** At least 60 credits including BL2101 and BL2106. **Level 3:** 120-125 credits comprising BL3301 or BL3307; BL3302 or BL4127; BL3303 or BL3306 or BL3309; BL3310 or BL3313; BL3311 or BL3314; BL3312 or BL3315. BL3000 is also required if BL3309 is taken. *Prior to 2006/7: 120-125 credits comprising BL3001 or BL3021; BL3002; BL3003 or BL3023; BL3004 or BL3102 or BL3024; BL3005 or BL3007 or BL3025; and BL3008. BL3000 is also required if BL3021 is taken.* **Level 4:** 120 credits comprising BL4112 or BL4107; BL4108 or BL4129; BL4109 or BL4110; BL4200 and BL4300.

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Marine Biology**	**Single Honours Marine Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** 120 credits from 2000-level Biology modules which must include BL2102. **Level 3:** 125 credits comprising BL3000; BL3307; BL3308; BL3306 or BL3309; BL3316; BL3317 and BL3318. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3022; BL3023;BL3024; BL3025 and BL3027.* **Level 4:** 120 credits comprising BL4121; BL4122; BL4123; BL4200 and BL4300.
(B.Sc. Honours): **Marine & Environmental Biology** **(Not available to entrants after 2005/6)**	**Single Honours Marine & Environmental Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** 120 credits from 2000-level Biology modules which must include BL2102. **Level 3:** 125 credits comprising BL3000; BL3307; BL3308; BL3306 or BL3309; BL3316; BL3317 and BL3318. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3022; BL3023; BL3024; BL3025 and BL3027* **Level 4:** 120 credits comprising BL4121; BL4122; BL4123; BL4200 and BL4300
(B.Sc. Honours): **Molecular Biology**	**Single Honours Molecular Biology Degree:** **Level 1:** 40 credits including passes in BL1001 and BL1201. BL1002 is also recommended for all students considering Honours Programmes in the School of Biology. **Level 2:** At least 60 credits including BL2101 and BL2104. **Level 3:** 120 credits comprising BL3301; BL3302; BL3303; BL3310; BL3311 and BL3312. *Prior to 2006/7: 120 credits comprising BL3001; BL3002; BL3003; BL3004;BL3005 and BL3008.* **Level 4:** 120 credits comprising BL4101 or BL4112; BL4102; BL4103; BL4200 and BL4300.
(B.Sc. Honours): **Neuroscience**	**Biology element of Single Honours Neuroscience Degree (Psychology requirements listed under School of Psychology entry):** **Level 1:** 60 credits comprising passes in BL1001; BL1201 and BL1002. **Level 2:** 60 credits including BL2104 or BL2106; and BL2101. **Level 3:** 120 credits comprising BL3301; BL4127; BL3303; BL3313; BL3317; BL3312 or BL3315. *Prior to 2006/7: 120 credits comprising BL3001; BL3002; BL3003; BL3004; BL3007 and BL3008* **Level 4:** 120 credits comprising BL4107 or BL4127; and either BL4200 OR (PS4050 plus PS4005). Also modules as listed under the School of Psychology entry for this degree

Degree Programmes	Programme Requirements at:
(B.Sc. Honours): **Physiology**	**Single Honours Physiology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201 **Level 2:** At least 60 credits including BL2101 and BL2106 **Level 3:** 120 credits comprising BL3301; BL3302 or BL4127; BL3303 or BL3306; BL3313; BL3311 or BL3314; BL3312 or BL3315. *Prior to 2006/7: 120 credits comprising BL3001; BL3002; BL3003; BL3004;BL3007 and BL3008* **Level 4:** 120 credits comprising BL4107 or BL4112; BL4108; BL4109 or BL4110; BL4200 and BL4300
(B.Sc. Honours): **Plant & Environmental Biology** **(Not available to entrants after 2005/6)**	**Single Honours Plant & Environmental Biology Degree:** **Level 1:** 60 credits comprising passes in BL1001; BL1002 and BL1201. **Level 2:** At least 60 credits including BL2103 and BL2105 **Level 3:** 125 credits comprising BL3301 or BL3307; BL3302 or BL3308; BL3306 or BL3309; BL3310 or BL3316; BL3317 and BL3318. BL3000 is also required if BL3308 or BL3309 is taken. *Prior to 2006/7: 125 credits comprising BL3000; BL3021; BL3022; BL3023; BL3024; BL3025 and BL3027.* **Level 4:** 120 credits comprising BL4124; BL4129; BL4125; BL4200 and BL4300.
(B.Sc. Honours): **Zoology**	**Single Honours Zoology Degree:** **Level 1:** 60 credits including passes in BL1001; BL1002 and BL1201. **Level 2:** At least 60 credits including BL2102 and BL2106. **Level 3:** 120 - 125 credits comprising BL3307; BL4127; BL3306 or BL3309; BL3313 or BL3316; BL3317; BL3315 or BL3318. BL3000 is also required if BL3308 or BL3309 is taken. *Prior to 2006/7: 120 - 125 credits comprising BL3001 or BL3021; BL3002 or BL3022; BL3003 or BL3023; BL3004; BL3025; BL3008 or BL3027.* *BL3000 is also required if BL3021 is taken, and both of these are required if BL3022 is taken.* **Level 4:** 120 credits comprising BL4107 or BL4122 or BL4124 (if BL3023 was taken); BL4121 or BL4127; BL4109 or BL4125; BL4200 and BL4300.

Modules

Normally the prerequisite for each of the following Honours modules is entry to the Honours Programme(s) for which they are specified, as well as any additional specific prerequisite(s) given.

General degree students wishing to enter 3000 modules and non-graduating students wishing to enter 3000 or 4000 level modules must consult with the relevant Honours Adviser within the School before making their selection.

Biology (BL) Modules

BL3000 Field Course

Credits: 5.0 Semester: summer vacation

Co-requisite: BL3308 or BL3309

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

Assessment: Continuous Assessment =100%

BL3301 Protein Function

Credits: 20.0 Semester: 1

Anti-requisite: BL3001

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 grounding in the basic laboratory techniques, including associated calculations, as well as those associated with the study of proteins and enzymes.

Class Hour: Lectures: Wed, Thurs 9am, Fri 10am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 9 only.

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

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

BL3302 Gene Regulation

Credits: 20.0 Semester: 1

Prerequisites: Normally BL1201 and BL2104

Anti-requisites: BL3002, BL4103

Co-requisite: BL3001

Description: This module builds on material covered in BL1201 Molecular Biology and BL2104 Biochemistry & Molecular Biology. It first considers the structure of genes and the composition of genomes and then examines genetic activity in eukaryotes in relation to nuclear organization, chromatin structure and epigenetic mechanisms. Regulation of expression at the levels of gene transcription, RNA processing, RNA stability and translation, are next covered in detail, drawing particular attention to the nature of protein-nucleic acid interactions. Specific control mechanisms in different prokaryotic and eukaryotic systems, induced by environmental, cell cycle, metabolic and developmental signals, are highlighted.

Class Hour: Lectures: Mon, Tues 9am, Thurs 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 10 only.

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

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

BL3303 Membranes & Cell Communication

Credits: 20.0 Semester: 1

Anti-requisite: BL3003

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 ephithelial 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) 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: Lectures: Mon 11am, Tues 12noon, Wed 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only.

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

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

BL3306 Adaptations of Organisms

Credits: 20.0 Semester: 1

Anti-requisite: BL3027

Description: This module deals with how physiological processes allow organisms, including humans, to cope with variation in particular aspects of their internal and external environments. Concepts of scale are central to understanding physical constraints on organisms and these will be dealt with at the beginning of the course. There will be an examination of the effects of size on metabolic rate, and the consequences of this for growth and development. A central feature of the course will be an exploration of the responses of organisms (plants and animals) to variation in temperature, light, osmotic stress and nutrients, both at the molecular and whole organism level. There will be an analysis of the physiological responses to seasonal fluctuations including reproductive seasonality, seasonal fattening, torpor and hibernation, including analysis of the mechanisms involved in monitoring and responding to changing conditions.

Class Hour: Lectures: Mon 12noon, Tues 11am, Wed 10am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only..

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

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

BL3307 Evolution

Credits: 20.0 Semester: 1

Anti-requisite: BL3023

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: Lectures: Wed, Thurs 9am, Fri 10am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 9 only..

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

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

BL3308 Aquatic Ecology

Credits: 20.0 Semester: 1

Prerequisite: BL3021

Anti-requisite: BL3022

Description: This module introduces the ecology of aquatic systems beginning with a description of the problems of life in a fluid medium. The module then considers the contrasting conditions that are inherent in freshwater, estuarine and marine systems. The influence of global climate variation and the close coupling between land and sea will be emphasised. Case studies will then be used to introduce the ecology of a variety of aquatic systems including tropical, temperate and polar systems.

Class Hour: Lectures: Mon, Tues 9am, Thurs 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 10 only. One short residential field-trip..

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

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

BL3309 Ecosystems

Credits: 20.0 Semester: 1

Prerequisites: Normally BL2105 or SD2001

Anti-requisites: BL3021

Description: The Ecosystems module will examine how ecosystems function and these functions provide services for humans: this information is essential for ecologists, conservationists and land managers. The module will use examples of natural systems being altered by man to demonstrate how ecosystems function and the consequences of anthropogenic change. The module will consider disturbance and regulation in ecosystems, atmospheric and hydrological regulation, (including the green house effect and acidification), soil ecology, conservation and management of natural resources, agricultural and grazed ecosystems (including GMOs), urban ecosystems and sustainable development.

Class Hour: Lectures: Mon 11am, Tues 12noon, Wed 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only.

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

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

BL3310 Metabolic & Clinical Biochemistry

Credits: 20.0 Semester: 2

Anti-requisite: BL3102

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 constiTuesnts; (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 Victoria Hospital will be incorporated into the course.

Class Hour: Lectures: Wed, Thurs 9am, Fri 10am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 8 only..

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

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

BL3311 Infection & Immunity

Credits: 20.0 Semester: 2

Prerequisites: Normally BL2104 and BL2101

Description: This module will include lectures in three component areas: human immune defences against infection, viral disease and effective treatment and pathogenicity of common bacterial infections. In all three component areas the emphasis will be on understanding at the molecular level.

Class Hour: Lectures: Mon, Tues 9am, Thurs 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 9 only.

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

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

BL3312 Pharmacology

Credits: 20.0 Semester: 2

Anti-requisite: BL3007

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: Lectures: Mon 11am, Tues, Fri 12noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 7 and 10 only.

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

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

BL3313 Neuroscience

Credits: 20.0 Semester: 2

Anti-requisites BL3004, BL3009

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: Lectures: Wed, Thurs 9am, Fri 10am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 8 only..

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

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

BL3314 Nutrition for Sport & Exercise

Credits: 20.0 Semester: 2

Prerequisites: BL2006

Description: This sports science module examines the physiology of nutrition and body composition in relation to sport, exercise and health. Health promotion initiatives advocate healthy eating and exercise as important factors in the prevention of disease and their associated risk factors. For athletes, appropriate nutritional strategies can maximize training, promote recovery and adaptation, and help offset injury and illness which are detrimental to performance. There are a number of different measures of body composition, for example body mass index, percentage body fat and somatotype, and these will be described and evaluated in relation to both health and sports performance. Maintaining body weight requires a balance of energy input and expenditure. Dietary analysis techniques and methods of measuring physical activity will be evaluated. The module will examine nutritional strategies for maintaining health and performance in a variety of sports and challenging environments. Dietary supplements are often used by individuals in an attempt to enhance health and performance. The use and value of substances such as creatine, caffeine, glycerol, various vitamins and minerals will be examined. The module includes practical work such as the measurement of body composition and determining the calorific expenditure in selected physical activities. The practical classes will supplement the lecture component of the module and will involve a range of non-invasive procedures carried out by members of the class.

Class Hour: Lectures: Mon, Tues 9am, Thurs 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 9 only.

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

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

BL3315 Reproduction and Development

Credits: 20.0 Semester: 2

Description: The enigma of development is how complexity arises from apparent simplicity – how an adult develops from an egg. This module will examine development from fertilisation to maturity in a range of organisms, but will concentrate on higher vertebrates including man, and the fruitfly *Drosophila*. Early-acting mechanisms for generating differences between initially identical cell populations to produce patterning and structure in embryos will be considered. The physiology of mammalian development from fertilisation to birth and lactation will be examined. The development of the nervous system will be another topic examined in depth. *Drosophila* embryonic development and the hormonal control of metamorphosis in flies and amphibians will be studied.

Class Hour: Lectures: Mon 11am, Tues, Fri 12noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 7 and 10 only.

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

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

BL3316 Animal Plant Interactions

Credits: 20.0 Semester: 2

Anti-requisite: BL4125

Description: This module concerns the coevolution of plants and animals, including the ecological, behavioural and physiological aspects of their interactions. Pollination biology and the constraints on participating plants and animals are dealt with in depth, including applied aspects of crop pollination, and this is followed by a review of seed dispersal. Then patterns of herbivory by insects, vertebrates and other animals are considered, illustrating the interactions of plant physical and chemical defences and herbivores' reciprocal adaptations from feeding specializations and host plant selection through to detoxification systems and life history adaptations. Interactions with third parties are also explained, especially plant-fungus-insect systems. There is an introduction to other tritrophic interactions (whereby plants can recruit herbivores' enemies as part of their defences, or recruit ants as biotic plant guards), to insects as plant pests, and to integrated and sustainable approaches to control measures and plant protection.

Class Hour: Lectures: Wed, Thurs 9am, Fri 10am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 8 only.

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

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

BL3317 Behavioural Ecology

Credits: 20.0 Semester: 2

Anti-requisite: BL3025

Description: This module covers the behaviour of animals and how it interacts with the environment in which they live. The major topics to be covered will be foraging behaviour, inter-species interactions, mating strategies and breeding systems, together with social behaviour and how factors such as kinship, conflict and cooperation influence it. Practical work will be in the form of mini-projects carried out by groups of students under the supervision of a member of staff.

Class Hour: Lectures: Mon, Tues 9am, Thurs 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 9 only.

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

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

BL3318 Biology of Marine Organisms

Credits: 20.0 Semester: 2

Prerequisites: Normally BL2102 and BL2105, plus BL3000

Description: This module will include lectures on the range of microbial and metazoan organisms and ecological systems in the marine environment. The coverage will range from bacteria, to algae, invertebrates and vertebrates (fish, birds, reptiles and mammals). The biology of marine organisms is considered in the context of both adaptations at the level of the individual and its expression in terms of large-scale latitudinal and depth-related variations in productivity and food web structure. Examples from the poles to the tropics and from shallow water to the deep ocean will be included. Practicals will be field- and laboratory-based and will provide an experimental introduction to both ecological and physiological problems in marine biology.

Class Hour: Lectures: Mon 11am, Tues, Fri 12noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 7 and 10 only.

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

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

BL4101 Structural Biology

Credits: 20.0 Semester: 1

Description: This module will introduce the students to the basic concepts and motifs of structural biology and the methods used to determine structure. The relationships between structure and function will be discussed. The applications of techniques such as X-ray crystallography and NMR in the determination of the structures of proteins, carbohydrates and nucleic acids will be described. The practical components will include demonstrations of techniques and laboratory work.

Class Hour: Lectures: Mon, Thurs 10am, Fri 9am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 9 only.

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

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

BL4102 Biotechnology and Bioinformatics

Credits: 20.0 Semester: 1

Description: This module will introduce students to recent developments in the fields of biotechnology and bioinformatics. The utilities and applications of bioinformatics in the biological sciences be discussed together with an overview of topics relevant to biotechnology.

WWW-based resources that allow database searching and information retrieval will be introduced and demonstrated. In particular, the module will cover: transgenic technologies, genome databases, gene expression and disease; protein structure and function; protein sequence comparisons and evolution; proteomics and protein characterisation by mass spectrometry.

The emphasis will be on equipping the student with a broad overview of the web-based resources available for biomedical research, and with practical experience in gathering, analysing and presenting such data.

Class Hour: Lectures: Tues, Wed 10am, Fri 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 10 only.

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

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

BL4103 Gene Expression

Credits: 20.0 Semester: 1

Prerequisite: BL3002

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: Lectures: Mon, Tues, Thurs 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only.

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

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

BL4107 Applied Neuroscience

Credits: 20.0 Semester: 1

Pre-requisite: BL2002 or BL3004

Description: This advanced module builds on material covered in BL3004 Neuroscience and it is recommended that students have previously taken that module. Topics covered may include the development of vertebrate axons and their connections, central pattern generation, neurodegenerative diseases and other neuropathologies, nerve regeneration and sensory physiology. Practicals will be used to supplement the lecture component of the module. Topics may include Glucose Tolerance, Immunocytochemistry, and Apoptosis.

Class Hour: Lectures: Mon, Thurs 10am, Fri 9am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 9 only.

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

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

BL4108 Systems Physiology & Pathology

Credits: 20.0 Semester: 1

Pre-requisite: BL2006

Description: This module includes lectures on renal, gastrointestinal, cardio-vascular, respiratory and skin physiology. The normal functioning of these systems is considered in detail, and consideration is then given to the pathophysiology of selected disease states. Inflammation and the body's response to injury will also be considered. 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: Lectures: Tues, Wed 10am, Fri 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 10 only.

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

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

BL4109 Developmental Biology

Credits: 20.0 Semester: 1

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. Practicals will include tissue culture, morphogenesis and work on early vertebrate development.

Class Hour: Lectures: Mon, Tues, Thurs 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only.

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

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

BL4110 Exercise Physiology

Credits: 20.0 Semester: 1

Prerequisite: BL4108

Description: Human beings exercise under different environmental conditions, varying from changes of pressure in diving, shortage of oxygen at altitude, and the demands provided by thermal extremes. Using examples from sport we shall examine the adaptations required to perform well under a variety of environmental conditions, and investigate whether training in abnormal conditions can benefit performance. Although not enough is known about the physiological limits to performance, we have been able to identify some of the key factors and establish valid tools of measurement. The module will assess a variety of physiological variables to evaluate the fitness of the trained athlete, for example, running economy, maximum oxygen consumption, and lactate accumulation. You will be required to carry out laboratory measurements of some of these variables and you should be prepared to act as a subject in those experiments not requiring maximal effort. To benefit fully from this module it is necessary to be active in sport or recreation.

Class Hour: Lectures: Mon, Tues, Thurs 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only.

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

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

BL4112 Cancer Biology

Credits: 20.0 Semester: 1

Pre-requisite: BL2002

Description: The module will provide a broad overview of cancer biology. It will contain 5 themes : Stem Cell Biology (normal stem cells, stem cell plasticity and proliferation regulation of stem cells); Properties of Tumour Cells (tumour cell kinetics, metastasis, epidemiology and carcinogenesis); Molecular Biology of Cancer (oncogenes, tumour supressor genes and multi-step events); Cancer Predisposition and Molecular Cytogenetics (chromosome structure and DNA damage, predisposition to cancer, cytogenetic changes); Cancer Therapy (principles of radiobiology, principles of radiotherapy and chemotherapy, prospects of treatment and prevention). The practical classes will illustrate how tumour cells can be investigated in the laboratory using cell culture, cytogenetic and molecular techniques.

Class Hour: Lectures: Mon, Thurs 10am, Fri 9am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 9 only.

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

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

BL4121 Marine Biology

Credits: 20.0 Semester: 1

Prerequisite: BL3022

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 and pelagic communities – their structure, dynamics and emergent properties – will be overviews of global patterns of diversity in the marine biosphere. The environmental control of reproductive activity leads to the consideration of marine invertebrate larval strategies and the settlement and metamorphosis of planktonic larval forms. The module concludes with consideration of the impacts of ongoing anthropogenic activities on marine environments.

Class Hour: Lectures: Tues, Wed 10am, Fri 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 10 only.

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

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

BL4122 Marine Mammal Biology

Credits: 20.0 Semester: 1

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: Lectures: Mon, Thurs 10am, Fri 9am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 9 only.

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

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

BL4123 Marine & Environmental Microbiology

Credits: 20.0 Semester: 1

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: Lectures: Mon, Tues, Thurs 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only.

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

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

BL4124 Evolutionary Ecology

Credits: 20.0 Semester: 1

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: Lectures: Mon, Thurs 10am, Fri 9am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 2, 5 and 9 only.

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

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

BL4125 Mutualisms and Interactions

Credits: 20.0 Semester: 1

Prerequisite: BL3021

Anti-requisite: BL3316

Description: This module concerns the coevolution of plants other organism, including physiological, behavioural and ecological aspects of their interactions. Pollination biology and the constraints on participating plants and animals are dealt with in depth. Then patterns of herbivory by insects, vertebrates and other animalsare considered, illustrating the coevolution of plant physical and chemical defences and herbivores' reciprocal adaptations. Tritrophic interactions (whereby plant defences can recruit herbivore enemies, or recruit ants as biotic plant guards) are also reviewed. Both beneficial and detrimental fungal and bacterial associations with plants are explored. The module culminates with an examination of the effects of human intervention upon plant genetics and crop productivity.

Class Hour: Lectures: Mon, Tues, Thurs 12 noon every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 4, 8 and 11 only.

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

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

BL4127 Mechanisms of Animal Behaviour

Credits: 20.0 Semester: 1

Description: This module deals with a variety of topics in animal behaviour and what is known of the mechanisms underlying them at both the neural and behavioural levels. Subjects dealt with range from simple patterns, such as locomotion, rhythms and escape responses, through mechanisms of sensory-motor integration, to orientation and navigation, how behaviour develops, mechanisms of communication, assessing animal needs and welfare. Where possible information on different levels of analysis will be integrated. The course will be accompanied by laboratory practicals and student seminars on special topics.

Class Hour: Lectures: Mon, Tues 9am, Thurs 11am every week. Practicals: maximum of 3 afternoons and one full day per week, weeks 3, 6 and 10 only.

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

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

BL4129 Conservation and Management of Living Resources

Credits: 20.0 Semester: 1

Description: This module will demonstrate how theoretical ecological concepts can be applied to practical problems of resource management in the developed and developing worlds. The concepts of sustainable development, the precautionary principle and environmental risk assessment will be introduced. Other topics will include the wise use of biological resources, particularly fisheries and bushmeat; the design and management of protected areas; and the conflicts between conservation and development. The course will be accompanied by practical sessions involving computer simulation, role playing and student seminar presentations on special topics.

Class Hour: and one Lectures: Tues, Wed 10am, Fri 12.00 noon every week. Practicals: maximum of 3 afternoons full day per week, weeks 3, 6 and 10 only.

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

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

BL4200 Research Project

Credits: 45.0 Semester: Whole Year

Anti-requisite: BL3200

Description: This project will involve the study of a defined problem within the area of 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%

BL4300 Recent Advances

Credits: 15.0 Semester: Whole Year

Anti-requisite: BL3300

Description: This module encourages awareness of recent developments throughout 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%