The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

School of Biosciences

Environmental Biology Course Handbook

2016-2017

Please note that all of the information given in this Student Course Handbook was correct at the time of going to press; Schools reserve the right to amend course structures or information and amend, substitute or withdraw modules detailed in this publication. Comments or feedback on the contents of this handbook are welcome, and will be used in the revised edition for 2017-2018. Any comments concerning this publication should be addressed to Kathy Wilson (Programme Manager) at the Sutton Bonington Campus or e-mail Kathy.Wilson@Nottingham.ac.uk.

This handbook is available in alternative formats. Please contact Kathy Wilson by emailing Kathy.Wilson@Nottingham.ac.uk or the Student Services Centre at the Sutton Bonington Campus to request an alternative format.

CONTENTS

1 Dates for Your Diary

Term dates

Autumn Term
Monday 26 September 2016 – Friday 16 December 2016

Spring Term
Monday 16 January 2017 – Friday 7 April 2017

Summer Term
Monday 8 May 2017 – Friday 23 June 2017

Semester dates

Autumn Semester
Monday 26 September 2016 – Saturday 28 January 2017

Spring Semester
Monday 30 January 2017 – Friday 23 June 2017

Exam dates

Autumn Semester
Monday 16 January 2017 to Saturday 28 January 2017 – including Saturday 21 January 2017

Spring Semester
Monday 22 May 2017 to Saturday 10 June 2017 – including Saturday 27 May and Saturday 3 June 2017

Late summer resits
Monday 21 August 2017 to Wednesday 30 August 2017 – excluding Saturday 26 August 2017

2 Course Handbook

This Manual is designed to give you all the information you need to allow you to progress your studies at Nottingham. It describes the various procedures and practices that are in place which are designed to help you achieve your goals. From time to time these have to be changed to meet new requirements put upon us by the University and changes are also made based on student opinion. Therefore at any time if you have a positive suggestion, which can bring about some improvement in what we do, please bring these to the attention of the Student Guild who are represented on a number of School Committees.

3 The School of Biosciences

The School of Biosciences is part of the Faculty of Science and is based mainly on the Sutton Bonington campus; the BSc/MSci Environmental Science and BSc Environmental Biology degrees are located at the University Park campus.

The School of Biosciences has over 80 academic members of staff, 895 undergraduate students and about 550 research and taught postgraduate students. Academic staff are allotted to one of 5 Divisions which reflect specific areas of teaching and research; Agricultural and Environmental Sciences, Animal Sciences, Food Sciences, Nutritional Sciences and Plant and Crop Sciences.

You can find full and detailed information about the School and its staff on our Website – www.nottingham.ac.uk/Biosciences

4 Advice

One of the first people you will meet is your Personal Tutor. Your Personal Tutor will be a member of academic staff with whom you have regular meetings, sometimes as part of a group. Your Tutor is there to give you help and support in person as well as guidance in academic matters. You should make every effort to establish a good relationship. Your Tutor will provide you with advice and details of your exam performance so it is essential that you discuss your progress, in confidence, with him/her at regular intervals.

Here are a few pieces of free advice; they come from fellow undergraduate students and from academic staff who helped us prepare this document.

- Most lecturers teach at a faster pace than you may be used to from school or college.
- Develop good note taking skills early in your university career.
- Lectures are progressive, i.e. each one builds on the last. Missing lectures is therefore dangerous, as is ignoring things that you didn't fully understand at the time.
- Module Conveners may issue a book list. Check with academic staff and 2nd and 3rd year students which are the most valuable to buy. You may not be able to afford them all. Books on your reading lists can be borrowed from the Libraries.
- You should expect to work outside of class time. This may include reading, rewriting your notes, doing coursework, writing reports, etc.
- Don't be afraid of asking questions in lectures. Lecturers like to know that students are following what they are saying. The question you ask may be exactly what other students were wondering but were afraid to ask. Most lecturers will provide opportunities for questions. You can also ask for help outside of lecture time.

- Don't be afraid to approach staff for help. Their offices are accessible to you and they have telephones and email. They are busy people but a large part of their work involves dealing with students. Please see "office hours" section for further details of how to make appointments with academic staff.
- Make use of their time, advice, experience and expertise.
- Remember that activities continue after the exams and that you are required to remain at the University until the end of each semester.
- Never hesitate to see the lecturer if you are having difficulty with his / her module or don't understand why you were given a particular mark
- Handing in coursework late means losing marks. 5% will be lost for every working day late.
- The School has a Learning Community Forum with staff and student representatives from each year. Use this system to make constructive comments about your course.
- If you become ill and have to miss more than a couple of days, or a coursework deadline, or if your performance in an exam is affected, go to see your tutor and complete an Extenuating Circumstances Form and on the website: http://www.nottingham.ac.uk/academicservices/qualitymanual/assessmentandawards/extenuating-circumstances-policy-and-procedures.aspx
- Missing an exam for any reason is extremely serious and should be avoided if at all possible. Let your Tutor know IMMEDIATELY and complete an extenuating circumstances form available as above.
- Check your email daily and Moodle updates; otherwise you may miss vital information.

5 Student Commitment

Students are expected to access their e-mail accounts regularly as this is the main means of communication. Please do not use any other personal email account which you may have for communication within the University. If you do, you risk losing out on important information

You are required to:

- **Read** this handbook and other documents referred to so that you are clear about the structure of your degree course and what is expected of you.
- **Abide** by University Ordinances, Regulations and other codes of practice (e.g. Computing, Safety etc.).
- Read **notices** placed on official notice boards, these provide an important primary channel of general communication and may advertise such information as re-arrangements to the teaching timetable.

  It is wise to carry a diary in which to note appointments with tutors, module conveners, course diary, etc.

6 Your School and Your Studies

Teaching Staff - Lecturers are responsible for teaching components of modules and for setting and marking assignments and examinations.

Each module has a **Convener** who is responsible for its organisation. At the start of the module, the Convener will issue to each student a document describing its aims, content, objectives, transferable skills, methods of assessment, dates for submission and return of coursework and penalties for late submission. Students will be given coursework turnaround details. S/he will also conduct a feedback exercise at the end of the module to gauge student opinion.

Each course has a **Course Director**, responsible for overseeing its structure and smooth running. The Course Director ensures balance between modules and liaises regularly with other staff to ensure that appropriate teaching and learning are provided. The **Course Directors** are directly responsible to the **Assistant Pro-Vice-Chancellor for Teaching and Learning** for ensuring that all levels of the teaching management structure operate efficiently. They should be notified of any significant problems. **Heads of Division** are ultimately responsible for the services provided by their staff.

The **Assistant Pro-Vice-Chancellor for Teaching and Learning** overseas the organisation and management of teaching across the School.

The **Semester 1 Tutor** is responsible for maintaining a balance of work between the core Semester 1 modules. S/he appoints student representatives and holds meetings at which any matters which students may wish to raise can be discussed. Don’t be afraid to make your views known!

A list of the staff who hold these positions are included in this handbook (see Staff Roles section). Students should feel able to approach any of them with concerns they may have about aspects of their education. Your Personal Tutor can advise you and make the appropriate contacts.

7 Staff Roles

Role In School	**Staff Member**	**Location** *See key at end of table*	**Tel**	**Email @nottingham.ac.uk**
Head of School	Prof Simon Langley-Evans	MB	16139	Simon.Langley-Evans
Head of Operations	Dr Sarah Johnson	MB	16000	Sarah.Johnson
PA to Head of School and School Manager (Academic Administration)	Ms Susan Blencowe	MB	16010	Susan.Blencowe
Sutton Bonington Programme Manager	Ms K J Wilson	Barn	16002	Kathy.Wilson
Sutton Bonington Manager	Miss Helen Wells	Barn	86504	Helen.Wells
4-Year Degree Tutor (Euro. Cert.)	Rachel Jessop	BBSB	16162	Rachel.Jessop
Marketing Manager	Ms Helen Rotherforth	MB	16607	Helen.Rotherforth
Sutton Bonington Programme Administration	Mrs Gill Fox	Barn	86501	Gillian.Fox
IT Support Officer	Mr Dave Walters	JCG	16511	Dave.Walters
U21 Co-ordinator	Rachel Jessop	BBSB	16162	Rachel.Jessop
Sutton Bonington Administrator	Mrs E Staves	Barn	86504	Elena.Staves
Sutton Bonington Senior Administrator	Mrs L Eaves	Barn	86508	Linda.Eaves

Building Locations

BBSB = Bioenergy and Brewing Science Building
GB = Gateway Building
MB = Main Building
SL = South Lab Building
SO = School Office, Main Building
JCG = James Cameron Gifford Library

Heads of Division	**Name**	**Building** *See key at end of table*	**Tel**	**Email @nottingham.ac.uk**
Animal Sciences	Prof P Garnsworthy	SL	16065	Phil.Garnsworthy
Agricultural and Environmental Sciences	Prof S Mooney	GB	16257	Sacha.Mooney
Food Sciences	Prof Tim Foster	FS	16246	Tim.Foster
Nutritional Sciences	Prof Andy Salter	NL	16120	Andy.Salter
Plant and Crop Sciences	Prof M Holdsworth	PCS	16323	Mike.Holdsworth

Key Roles	**Name**	**Building**	**Tel**	**Email @nottingham.ac.uk**
Warden Bonington Hall	Dr I Hardy	SL	16052	Ian.Hardy
Senior Tutors	Prof M R Luck Dr L Bailey	SL	16309 16255	Martin.Luck Liz.Bailey
Semester 1 Tutor	Dr K Pyke	PCS	13216	Kevin.Pyke
Exam. Officer	Dr M Elmes	NL	16183	Matthew.J.Elmes
Study Abroad Co-ordinator	Dr Marcus Alcocer	NL	16103	Marcus.Alcocer
Biosciences Director of Learning and Teaching	Dr Fiona McCullough	NL	16118	Fiona.Mccullough
Malaysia School Coordinator	Dr Marcus Alcocer	PCS	16013	Marcus.Alcocer
Industrial Placement Officers & School Placement Officers	Dr J Wayte Rachel Jessop	BioB	16171 14380	Judith.Wayte Rachel.Jessop

Building Locations

BioB = Bioenergy Building
FS = Food Sciences
GB = Gateway Building
NL = North Lab
PCS= Plant and Crop Sciences
SL = South Lab Building

Course Directors	**Name**	**Building** *See key at end of table*	**Tel**	**Email @nottingham.ac.uk**
Agriculture Agricultural and Crop Science Agricultural and Environmental Science Agricultural and Livestock International Agricultural Science	Prof P Wilson	SL	16075	Paul.Wilson
Animal Science	Dr D Sweetman	SL	16019	Dylan.Sweetman
Applied Biology & Biotechnology	Dr Nagamani Bora (Mani)	PCS	TBC	Nagamani.Bora
Environmental Biology	Dr Ruth Blunt	Gateway Building, SB, or B47, Life Sciences, UP	16288	Ruth.Blunt
Environmental Science	Dr Ruth Blunt	Gateway Building, SB, or B47, Life Sciences, UP	16288	Ruth.Blunt
Food Science & Nutrition and Food Science	Dr D Gray	FS	16147	David.Gray
Microbiology	Dr J Hobman	FS	16166	Jon.Hobman
Master of Nutrition and Dietetics	Dr F McCullough	NL	16118	Fiona.Mccullough
Nutrition	Dr P Jethwa Dr J Majewicz	NL NL	16604 16106	Preeti.Jethwa Jon.Majewicz
Plant Science	Dr Kevin Pyke	PCS	13216	Kevin.Pyke

Building Locations

FS= Food Sciences Building
GB = Gateway Building
NL = North Lab Building
PCS= Plant and Crop Sciences
SL = South Lab Building

8 Academic Staff and Locations

Name	Room	Telephone Number	Divisions*
Dr R Alberio	B223, South Laboratory Building	0115 951 6304	AS
Dr M Alcocer	49E, 2nd Floor, North Laboratory Bldg	0115 951 6103	NS
Dr R Anand-Ivell	B216, South Laboratory Building	0115 951 6298	AS
Mrs A Avery	49D, North Laboratory Building	0115 951 6238	NS
Dr E Bailey	C21, The Gateway Building	0115 951 6255	AES
Dr M Bell	B228, South Laboratory Building	0115 951 6056	AES
Ms M Benlloch Tinoco	A18 Biosciences. Main Building	0115 951 6146	MB
Prof M J Bennett	C06, Plant Sciences Building	0115 951 3255	PCS
Dr A Bishopp	A15, Plant Sciences Building	0115 951 6108	PCS
Dr R Blunt	B47, Life Sciences Building **or** C18 Gateway Building	0115 951 3238	AES
Dr N Bora	B06, Bioenergy and Brewing Science Bldg	0115 951 6011	PCS
Dr J Brameld	43, 1st Floor, North Laboratory Bldg	0115 951 6133	NS
Prof M Broadley	A05, Plant Sciences Building	0115 951 6382	PCS
Dr K Brown	B30a, Food Science Building	0115 951 6509	FS
Dr N Chapman	306, South Laboratory Building	0115 951 6082	PCS
Dr L Coneyworth	58, 2nd Floor, North Laboratory Bldg	0115 951 6124	NS
Prof I F Connerton	B28, Food Sciences Building	0115 951 6119	FS
Dr D Cook	C04, Bioenergy and Brewing Science Bldg	0115 951 6245	FS
Prof N Crout	C19, The Gateway Building	0115 951 6253	AES
Prof C E R Dodd	B30, Food Science Building	0115 951 6163	FS
Dr S Egan	C21 School of Veterinary Medicine and Science	0115 951 6659	VS
Dr M Elmes	53, 2nd Floor, North Laboratory Bldg	0115 951 6183	NS
Dr I Fisk	A28, FS Building	0115 951 6037	FS
Dr R Ford	C03, Bioenergy and Brewing Science Bldg	0115 951 6685	FS
Prof T Foster	B29, FS Building	0115 951 6246	FS
Dr M J Foulkes	312, South Laboratory Building	0115 951 6024	PCS
Dr R G Fray	C33, Plant Sciences Building	0115 951 6371	PCS
Dr A P French	C08a, Plant Sciences Building	0115 951 6108	PCS
Prof P C Garnsworthy	B203, South Laboratory Building	0115 951 6065	AS
Dr Z Gonzalez-Carranza	C11, Plant Sciences Building	0115 951 6335	PCS
Dr N Graham	C30, Plant Sciences Building	0115 951 6681	PCS
Dr D Gray	A29, FS Building	0115 951 6147	FS
Dr D Greetham	A20 Food Science	0115 951 6578	FS
Prof S E Harding	A15, The Limes	0115 951 6148	FS
Dr I Hardy	C26, The Gateway Building	0115 951 6052	AES
Dr J Harris	C18, Vet School	0115 951 6316	AS
Dr K Harris-Adams	C311, South Laboratory Building	0115 951 6066	AES
Dr P J Hill	B21, FS Building	0115 951 6169	FS
Dr J L Hobman	B22, FS Building	0115 951 6166	FS
Prof M J Holdsworth	301B, South Laboratory Building	0115 951 6046	PCS
Prof J Hort	C10, Bioenergy and Brewing Science Bldg	0115 951 6222	FS

Rachel Jessop	C05, Bioenergy and Brewing Science Bldg	0115 951 6162	FS
Dr P Jethwa	55, North Laboratory Building	0115 951 6604	NS
Miss J Kearns	30, 1st floor, North Laboratory Bldg	0115 951 6756	NS
Prof I P King	C21, Plant Sciences Building	0115 951 6372	PCS
Dr J King	C26, Plant Sciences Building	0115 951 3205	PCS
Dr B Lomax	C24, The Gateway Building	0115 951 6258	AES
Prof M R Luck	B207, South Laboratory Building	0115 951 6309	AS
Dr S Lydon	C08, Plant Sciences Building	0115 951 6289	PCS
Dr J Majewicz	37, 1st floor, North Laboratory Building	0115 951 6106	NS
Dr G Mann	B208, South Laboratory Building	0115 951 6326	AS
Dr J Margerison	B209 South Laboratory Building	0115 951 6301	AS
Dr S Mayes	301C, South Laboratory Building	0115 951 8062	PCS
Dr F S W McCullogh	26,1st Floor, North Laboratory Building	0115 951 6118	NS
Dr K Mellits	B26, FS Building	0115 951 6172	FS
Dr K M Millar	B67, Vet School	0115 951 6303	AS
Prof S Mooney	C31, The Gateway Building	0115 951 6257	AES
Dr E H Murchie	301C, South Laboratory Building	0115 951 6082	PCS
Dr A Murton	49H, 2nd Floor, North Laboratory Building	0115 823 6592	NS
Dr T Parr	53A, 2nd Floor, North Laboratory Bldg	0115 951 6128	NS
Miss J Pearce	49G, 2nd Floor, North Laboratory Bldg	0115 951 6105	NS
Dr C Powell	C02, Bioenergy and Brewing Science Bldg	0115 951 6191	FS
Dr S Price	CO8 Bioenergy and Brewing Science Bldg	0115 951 6742	FS
Dr K Pyke	C09, Plant Sciences Building	0115 951 3216	PCS
Dr D Quain	C08 BABS	0115 951 6160	FS
Dr C Raaff	26 North Laboratory Bldg	0115 951 6121	NS
Dr S Ramsden	308, South Laboratory Building	0115 951 6078	AES
Dr R Ray	303, South Laboratory Building	0115 951 6094	PCS
Dr C E D Rees	B23, FS Building	0115 951 6167	FS
Prof K Ritz	C22 Gateway Building	0115 951 6288	AES
Dr T P Robbins	C27, Plant Sciences Building	0115 951 6329	PCS
Dr A Rosenthal	A24 Food Sciences	0115 951 6038	FS
Prof A M Salter	32A, 1st Floor, North Laboratory Bldg	0115 951 6120	NS
Dr D Scott	B19, FS Building	0115 951 6221	FS
Prof G Shaw	C29, The Gateway Building	0115 951 3206	AES
Dr C Siettou	C304 South Laboratory Building	0115 951 6306	AES
Prof K D Sinclair	B210, South Laboratory Building	0115 951 6053	AS
Dr M S Sjogersten	C27, The Gateway Building	0115 951 6239	AES
Dr D L Sparkes	330, South Laboratory Building	0115 951 6074	PCS
Dr D Stekel	C20, The Gateway Building	0115 951 6294	AES
Dr C Stevenson	A57, Vet School	0115 951 6055	AS
Dr R Stoger	B232, South Laboratory Building	0115 951 6232	AS
Miss R Stow	40, 1st floor, North Laboratory Bldg	0115 951 6170	NS
Dr A Swali	A20, Ground Floor, FS Bldg	0115 951 6578	FS
Dr R Swarup	C31, Plant Sciences Building	0115 951 6284	PCS
Dr D Sweetman	B234, South Laboratory Building	0115 951 6019	AS

Dr J A Swift	57a, Second Floor, North Lab	0115 951 6178	NS
Dr R Tarlington	School of Veterinary Medicine and Science	0115 951 6273	VS
Dr M Taylor	52, 2nd Floor, North Laboratory Bldg	0115 95 16104	NS
Dr A Waterfall	B224, South Laboratory Building	0115 951 6307	AS
Dr S Welham	24, North Laboratory Building	0115 951 6129	NS
Dr D Wells	C07, Plant Sciences Building	0115 951 6108	PCS
Dr H West	C28, The Gateway Building	0115 951 6268	AES
Mrs E Weston	A22, FS Building	0115 951 6146	FS
Dr G White	B227, South Laboratory Building	0115 951 6068	AS
Dr K Whitehead	28A, 1st Floor, North Laboratory Bldg	0115 951 6136	NS
Prof P Wilson	332, South Laboratory Building	0115 951 6075	AES
Prof Z A Wilson	A03, Plant Sciences Building	0115 951 3235	PCS
Prof J Wiseman	B205, South Laboratory Building	0115 951 6054	AS
Dr B Wolf	A27, Ground Floor, FS Bldg	0115 951 6134	FS
Dr S Young	C25, The Gateway Building	0115 951 6256	AES

***Divisional codes**

AES Agricultural & Environmental Sciences
AS Animal Sciences
BBS Bioenergy and Brewing Science Bldg
FS Food Sciences
MB Main Building
NS Nutritional Science
PCS Plant and Crop Sciences
VS School of Veterinary Medicine and Science

9 Course Structure, Organisation and Choosing Your Modules

The Academic Year

The academic year at Nottingham is based on 2 semesters (Autumn and Spring) spread over three terms.

The following definitions might be helpful to you:

- **Credits** indicate a quantity of assessed learning. They contribute to a cumulative indication of modules which a student has completed. One credit equates to approximately 10 hours of study.
- A **Module** is a specified programme of study which is self-contained and attracts a specified number of credits. Examinations are held at the end of most modules. A ten credit module accounts for approximately 100 hours of your time, of which usually no more than 40 hours will be spent in the lecture room or laboratory
- A **Course of Study** is a set of modules satisfying the requirements for a particular degree and attracting 320 credits for an Ordinary Bachelor degree and 360 credits for an Honours degree.

- The levels in a course of study leading to an Honours degree are as follows

  - Year 1 (120 credits) Level 1
  - Year 2 (120 credits) Level 2
  - Year 3 (120 credits) Level 3

And for a Master of Nutrition and Dietetics or MSci degree

  - Year 4 (120 credits) Level 4

Credits achieved in Year 1 are for progression purposes only and will not contribute to the final degree classification.

- A **semester** is a division of the academic year. It consists of twelve weeks of teaching, coursework and revision, plus two (Autumn Semester) or four (Spring Semester) weeks of assessment and consultation.
  Note: Although each academic year is divided for teaching purposes into two semesters, there is still a three-term pattern of attendance, with breaks at Christmas, Easter and during the summer.
- A **year** is period of study consisting of an Autumn Semester followed by a Spring Semester. **Assessment** may be by means of written examination papers, oral examinations or coursework. Progression and/or degree classification are based on the outcome of the assessment.
- A **mark** module a numerical indication of the quality of the assessed work completed by a student in each. Marks awarded are subject to the approval of the Board of Examiners and are ratified by an External Examiner.

Choosing optional modules*

At module advisory days you will be asked to complete a module registration form that details your chosen optional modules for ALL PERIODS, i.e. for modules totalling 120 credits. All entries must include the module code. **All optional choices must be approved and signed by your Course Director.** You will have an opportunity at the beginning of the Autumn/Spring Semesters (the "Two week change of mind period") to make adjustments to your choices for that semester; you will also need to check that there are no timetable clashes.

Your choice of modules must normally total 60 credits per semester, and in any event not less than **50 credits** or more than **70 credits** per semester. To determine how a Full Year module contributes to the number of credits in a given semester, check the semester credit split for that module in the Module Catalogue modulecatalogue.nottingham.ac.uk/Nottingham

IT IS YOUR RESPONSIBILITY to see that your combination of modules accords with the Regulations for your course and teaching timetable. **Failure to do so could prevent you from progressing to the next year of the course or from graduating.**
Once you have chosen your optional modules and they have been approved, IT IS YOUR **RESPONSIBILITY** to ensure that you read the Declaration, sign the form and hand it to School Office staff. After that date changes to Full Year and Autumn Semester choices will not be allowed. **Failure to hand in the form by the date displayed may lead to incorrect examination entries and records.**

**There are some courses in Year 1 where there are no optional modules; however this information is useful for Years 2 and 3.*

Modules outside Biosciences

If you wish to register for an optional module from outside the School of Biosciences, you should write the module details on your Module Entry Form and obtain a signature in the "Agreed" box from the School that offers the module, as confirmation that the offering School accepts your registration (or email and provide email confirmation).

A complete list of modules within the University can be found in the Catalogue of Modules at modulecatalogue.nottingham.ac.uk/Nottingham

10 Environmental Biology

Course Director: Dr Ruth Blunt **Telephone**: 0115 951 3238
Contact details: e: Ruth.Blunt@nottingham.ac.uk

See "taught" column to check the semester in which modules are taught

Qualifying Year (Year 1)

Compulsory

Students must take all modules in this group

Code	Title	Credits	Taught
C111E1	Global Environmental Processes	20	Autumn
C11BE1	Dissertation in Environmental Science	20	Full Year
C11EEB	Evolution, Ecology and Behaviour	20	Full Year
C11LOE	Life on Earth	20	Full year
D212E4	Environmental Science and Society	20	Full Year

AND 20 credits from this group

AA1017	The Anthropology of Human Ecology	10	Spring
C51201	Micro-Organisms and Disease	10	Spring
C112P1	Plant Science	10	Spring
D212A1	Grassland Management	10	Spring
D212A2	Contemporary Agricultural Systems	10	Spring

Part I (Year 2)

Year 2
Compulsory

Students must take all modules in this group

Code	Title	Credits	Taught
C12338	Ecology	10	Autumn
C123E3	Soil Science	10	Autumn
D223E2	Environmental Science Field Course	10	Autumn
D223E3	Research and Professional Skills for Environmental Scientists 1	20	Autumn
D224E5	Research and Professional Skills for Environmental Scientists 2	20	Spring

Restricted

Students must take a minimum of 50 and a maximum of 50 additional credits, suggested modules are listed below.

Code	Title	Credits	Taught
C12321	Animal Behaviour	10	Autumn
F82228	Patterns of Life (10cr) Autumn	10	Autumn
C123E7	Climate Change Science	10	Autumn

D223E4	Ecosystem Processes	10	Autumn
D223P9	Applied plant physiology: from cell to crop	20	Autumn
C12458	Biological Photography and Imaging 1	10	Spring
C12473	Natural Systems	10	Spring
C12477	Evolutionary Biology of Animals	10	Spring
C124E0	Soil and Water Science	20	Spring
D224E4	Computer Modelling in Science: Introduction (UP)	20	Spring
D224P7	Plant Pests and Diseases	20	Spring
F82328	Patterns of Life (10cr Spring)	10	Spring

Part II (Year 3)

Compulsory

Code	Title	Credits	Taught
D23BE1	Research Project in Environmental Science	40	Full Year

Restricted

Students must take 80 additional credits, suggested modules are listed below.

Code	Title	Credits	Taught
C13582	Biological Photography and Imaging 2	10	Autumn
C13592	Evolutionary Ecology	10	Autumn
C43541	Conservation Genetics	10	Autumn
C135E5	Environmental Pollution Field Course	10	Autumn
C135E8	Arctic Ecology Field Course	10	Autumn
C135E9	Computer Modelling in Science: Applications	20	Autumn
D235P6	Plants and the Light Environment	10	Autumn
D235Z5	Applied Bioethics 1: Animals, Biotechnology and Society	10	Autumn
C136E6	Environmental Biotechnology	10	Spring
C136E7	Environmental pollutants: fate, impact and remediation.	20	Spring
D236E2	Geobiology	10	Spring
D236P3	Plant Disease Control	10	Spring
D236P7	Plants and the Soil Environment	10	Spring
D236Z6	Applied Bioethics 2: Sustainable Food Production, Biotechnology and the Environment	10	Spring

11 Table of Modules

Revised 20/08/2016

Semester 1
followed by year 1 students in autumn session 2016/17

Title	Code	Agric (Production)	Agric (Business)	iABM	Ag & C	Ag & LS	Ani Sci	Biotech	Dietetics	Env Biol	Env Sci	Food Sci	Microbio	Nutrition	Nutri and Food Sci	Plant Sci
Biosciences Tutorials (Academic Development) & Foundation Scienc	D21BG1	10 of 20	10 of 20	10 of 20	10 of 20	10 of 20	10 of 20	10 of 20				10 of 20	10 of 20	10 of 20	10 of 20	10 of 20
The Biosciences and Global Food Security	D211F3	10	10	10	10	10	10	10	10			10	10	10	10	10
Biochemistry – The Building Blocks of Life	D21BN2	10 of 20			10 of 20	10 of 20	10 of 20	10 of 20	10 of 20			10 of 20	10 of 20	10 of 20	10 of 20	10 of 20
Genes and Cells 1	D211P1	10			10	10	10	10	10				10	10		10
Animal Biology	D211A2	10	10	10		10	10									
Introduction to Nutrition	D21BN1					10 of 20	10 of 20		10 of 20			10		10 of 20	10 of 20	
Agricultural Business in the Global Economy	D211A3		20	20												
Microbes and You	D21BF3												10 of 20			
The Physiology of Microbes	D21BF7							10 of 20					10 of 20			
Dietetics Tutorial (academic Development)	D21BN6								5 of 10							
Introduction to Dietetics	D21BN5								5 of 10							
Food Commodities and Primary Processing	D211F4											10			10	
Food Materials and Ingredients	D21BF1											10 of 20		10 of 20	10 of 20	
The Physiology of Microbes	D21BF7															
Introduction to Health Behaviours	D21BN4								10 of 20					10 of 20		
Global Environmental Processes (UP)	C111E1									20	20					
Environmental Geoscience (UP)	C111E5										20					
Evolution, Ecology and Behaviour	C11EEB									10 of 20						
Dissertation in Environmental Science (UP)	C11BE1									10 of 20	10 of 20					
Environmental Science and Society	D212E4										10 of 20					
Life on Earth (UP)	C11LOE									10 of 20						
Social Psychology UP)	C81SOC												10			
Molecules that Changed the World (UP)	F11MCW												10			
Plant Science Research Tutorials	D212P5				10											10

NB Modules in semesters 2 - 6 may have pre-requisite modules. It is your responsibility to ensure you are taking the appropriate pre-requisites for later modules.
Module choices are subject to timetabling constraints. It is therefore important to check the timetable and pre-requisites when making your module choices.

Black sections: core Grey Sections: recommended options (UP) = Module based at University Park

Revised 20/08/2016

Semester 2 followed by students in spring semester 2016/17

		Agric (Production)	Agric (Business)	iABM	Ag & C	Ag & LS	Ani Sci	Biotech	Dietetics	Env Biol	Env Sci	Food Sci	Microbiol	Nutrition	Nutri & Food Sci	Plant Sci
General	Module No															
Biosciences Tutorials (Academic Development) and Foundation Scien	D21BG1	10 of 20	10 of 20	10 of 20	10 of 20	10 of 20	10 of 20	10 of 20				10 of 20	10 of 20	10 of 20	10 of 20	10 of 20
Biochemistry – The Building Blocks of Life	D21BN2	10 of 20			10 of 20	10 of 20	10 of 20	10 of 20	10 of 20			10 of 20	10 of 20	10 of 20	10 of 20	10 of 20
Applied Genetics	D212P3					10	10	10					10			10
Introduction to Nutrition	D21BN1					10 of 20	10 of 20		10 of 20			10 of 20		10 of 20	10 of 20	
The Physiology of Microbes	D21BF7							10 of 20					10 of 20			
Microbes and You	D21BF3												10 of 20			
Food Materials and Ingredients	D21BF1											10 of 20		10 of 20	10 of 20	
Contemporary Agricultural Systems	D212A2	10	10	10	10	10				10	10	10			10	
The Ecology of Natural and Managed Ecosystems	D211E5	20	20	20	20						20					20
Introduction to Dietetics	D21BN5								5 of 10							
Dietetics Tutorials (academic development	D21BN6								5 of 10							
Introduction to Health Behaviours	D21BN4								10 of 20					10 of 20		
Grassland Management	D212A1	10	10	10	10	10				10	10					10
Microbial Physiology	D212F7											10				
Physiology for Food Scientists	D212F9														10	
Introductory Physiology	D212Z5						20	20	20					20		
Dissertation in Environmental Science (UP)	C11BE1									10 of 20	10 of 20					
Life on Earth	C11LOE									10 of 20						
Evolution, Ecology and Behaviour	C11EEB									10 of 20						
Integrated Agri-Food Markets and Marketing	D212A3		20	20												
Managing Tourism & the Environment: Conflict or Consensus (UP)	N12122										10					
Environmental Science and Society	D212E4									10 of 20	10 of 20					
The Anthropology of Human Ecology (UP)	AA1017									10	10					
Microorganisms and Disease (UP)	C51201									10			10			
Plant Science (UP)	C112P1	10			10			10		10	10					10

NB Modules in semesters 2 - 6 may have pre-requisite modules. It is your responsibility to ensure you are taking the appropriate pre-requisites f
Module choices are subject to timetabling constraints. It is therefore important to check the timetable and pre-requisites when making your module choices.

Black sections: core Grey Sections: recommended options (UP) = Module based at University Park

12 Timetable Information

Academic Year 2016-2017 Week Pattern for the UK CAMPUS

Teaching starts Thursday 29 September 2016 (if your modules are taught on either a Thursday or Friday)

Syllabus Plus Timetable Week	Teaching Week	Week Commencing	Comments
1	1	26/09/2016	*Registration/Induction*
2	2	03/10/2016	Autumn Semester
3	3	10/10/2016	Autumn Semester
4	4	17/10/2016	Autumn Semester
5	5	24/10/2016	Autumn Semester
6	6	31/10/2016	Autumn Semester
7	7	07/11/2016	Autumn Semester
8	8	14/11/2016	Autumn Semester
9	9	21/11/2016	Autumn Semester
10	10	28/11/2016	Autumn Semester
11	11	05/12/2016	Autumn Semester
12	12	12/12/2016	*term finishes Friday 16/12/16*
13	Vacation	19/12/2016	Christmas
14	Vacation	26/12/2016	Christmas
15	Vacation	02/01/2017	Christmas
16	Vacation	09/01/2017	Christmas
17	Assessment	16/01/2017	Assessment
18	Assessment	23/01/2017	Assessment
19	1	30/01/2017	Spring Semester
20	2	06/02/2017	Spring Semester
21	3	13/02/2017	Spring Semester
22	4	20/02/2017	Spring Semester
23	5	27/02/2017	Spring Semester
24	6	06/03/2017	Spring Semester
25	7	13/03/2017	Spring Semester
26	8	20/03/2017	Spring Semester
27	9	27/03/2017	Spring Semester
28	10	03/04/2017	Spring Semester (ends 07/04//17)
29	Vacation	10/04/2017	Easter (Good Friday 14/04/17)
30	Vacation	17/04/2017	Easter (Easter Monday 17/04/17)
31	Vacation	24/04/2017	Easter
32	Vacation	01/05/2017	Easter
33	11	08/05/2017	Spring Semester
34	12	15/05/2017	Revision/Assessment
35	Assessment	22/05/2017	Assessment
36	Assessment	29/05/2017	Assessment
37	Assessment	05/06/2017	Assessment
38	-	12/06/2017	-
39	-	19/06/2017	*term finishes Friday 23/06/17*
40		26/06/2017	
41		03/07/2017	
42		10/07/2017	
43		17/07/2017	
44		24/07/2017	
45		31/07/2017	

46		07/08/2017	
47		14/08/2017	
48	Assessment	21/08/2017	Re-sit Period
49	Assessment	28/08/2017	Re-sit Period
50		04/09/2017	
51		11/09/2017	
52		18/09/2017	

13 Teaching Methods

Lectures

Throughout your university career, you will find that lectures are the most common method of teaching. It is most important for you to ensure that you have a set of good clear notes based on the lectures **and** your own reading. As you progress through the second and third years of your degree, you will be expected to do increasing amounts of reading; it is therefore useful to develop your reading skills during your first year. Teaching of some modules is complemented by the use of teaching software.

Hints and tips for making the most effective use of the teaching and learning opportunities available to you are provided in S*tudy Skills Guide* given to all students at the beginning of their first year).

NB books which should be purchased will be identified at the start of teaching - you are advised not to buy any books prior to this unless otherwise indicated in the recommended reading lists at the end of each module synopses.

Practical Classes

Course requirements may require you to take practical classes. These may involve laboratory experiments or observations and analysis of data obtained during the sessions. Practical sessions provide an opportunity to learn and develop additional skills in techniques, observation and analysis. Practical classes also provide an opportunity to extend your knowledge of topics not covered in lectures. For each practical course you will receive a laboratory manual or collection of schedules which will expand on the learning experience of the course.

Some large first year classes are taught simultaneously in adjacent laboratories. Consult the class lists posted on the notice boards to identify the laboratory you will work in. For each practical class, at least one member of academic staff will always be in attendance. S/he will be accompanied by postgraduate students who work as demonstrators. In some cases, technicians may also be present to assist. The teaching team is present in the laboratory to aid your learning experience, so please seek their help as much as you need, and ensure you carry out your work safely, with no harm to yourself or other students. Practical classes provide a valuable opportunity for you to get to know the academic staff in a less formal way and for them to help you. These classes frequently provide an excellent opportunity for you to raise questions from the lecture course with the member of staff and deal with problems you may have.

For all practical classes, you **MUST WEAR** a suitable full-length laboratory coat, which must be buttoned at all times. You will be given a lab coat and safety glasses during Week 1 and advised about any other items you need to purchase. You **MUST** also **WEAR** safety glasses at all times unless advised to the contrary by an academic member of staff.

Safe working and good laboratory practices are essential in the laboratory environment and all laboratory exercises must be formally assessed under the regulations of COSSH. Details of these assessments are noted in the laboratory manual or schedule to draw your attention to specific hazards and the requirements of safe practice. During the introduction to a practical class, the member of staff in charge will give a verbal statement on safety issues.

Food and drink **MUST NOT** be taken into the laboratory.

Assessed Work

Many modules have an element of student-centred learning, especially in Parts I (Year 2) and II (Year 3) of your course. The work involved in these is assessed and forms part of the overall mark for the module. The proportion of the mark allotted to coursework is identified in each module description. Penalties are applied for late submission of coursework (5% per working day), unless there are extenuating circumstances and appropriate documentation is provided. In general, modules in the School of Bioscience use electronic submission of coursework through Moodle as the means of submission.

IT Training

IT is increasingly important as a basis of learning, communication and the preparation of your work e.g. dissertation, BSc project thesis and laboratory reports. It is important that you develop/improve your IT skills as you progress through your course.

Computer-aided Learning (CAL)

Several modules include computer-based teaching material, quizzes, exercises, simulations. In order to use these, you must be registered on the School of Biosciences Network. You may be assessed on some of these packages while using them or in the form of a conventional write-up. You should be prepared to take notes as you work through material on computers.

14 Assessment, Progression, Compensation and Reassessment

The University Undergraduate Course Regulations apply to all the School's BSc, MSci and MNutr degrees.

The regulations can be found at:
www.nottingham.ac.uk/academicservices/qualitymanual/studyregulations/studyregulationsforundergraduatecourses.aspx

You should note that:

- The pass mark for a module is 40%.
- **Progression and Compensation (BSc)**: You don't need to pass all modules in order to progress to the next stage of your course. Compensation of failed modules can be achieved in the following ways – if you have:
  (a) passed modules worth at least 80 credits and have a weighted average for the stage of at least 40% with no module marks of less than 30%;
  or
  (b) passed modules worth at least 100 credits and have a weighted average for the stage of at least 50%.
  or
  (c) passed modules worth at least 90 credits, have marks of 30% or more in modules worth at least 110* credits, and have a weighted average for the stage of at least 45%.

  Progression and Compensation (MNutr): At the Part I, Part II and Part III stage, no core module can be compensated with the exception of optional modules for which university regulations apply. In addition, students must obtain at least 35% in both the examination and coursework components of these modules, although a mark between 35% and 39% in either the examination or coursework may be compensated by the other component of assessment.

  Progression (MSci): At the end of Part I, students on the MSci degree must achieve an overall average of 55% at first sit in order to progress to Part II.

- **Reassessment:** If you do not reach the criteria for progression at the end of stage of study, you have a right to one re-assessment in each failed module. The form of reassessment is normally the same as for the first sit, with some exceptions (for example some MCQ papers are sometimes replaced with essay-style papers).
  For modules which are assessed by both coursework and exam, the School of Biosciences requires that, if the module has been failed overall, then you must be reassessed in the examination element of that module, even if that component of assessment has been passed.

  In addition, if you have failed the coursework overall (of a module which is assessed by both coursework and examination) you may elect to resubmit remedial coursework. However, if you have passed your coursework overall, you are not entitled to resubmit either the whole coursework or any failed component within your coursework assessments. If you wish to take up the option of remedial coursework, you must make contact with the appropriate module convener (or his/her representative) **within 7 days** of the date of the letter notifying you that you have failed to progress. The module convener will give you a title and submission date for the coursework. Any remedial

coursework must be submitted before the start of the August examination period. However, individual module conveners have the right to set earlier deadlines at the time of setting the coursework.

Please note: for modules which have both an examination and coursework component, it is not possible for you to be reassessed by resubmitting coursework alone; you are required to retake the examination, even if this element of the module has been passed.

This policy allows students to maximise their chances of passing the module after reassessment. In Part I (and Part II [Master of Nutrition]), the ORIGINAL marks are carried forward for degree classification purposes. However, reassessment marks may be considered by the examining boards if the candidate is on the borderline between degree classes.

- **Progression after reassessment**: For progression purposes, the higher or highest of the marks obtained in each module (at first attempt or upon re-assessment) are considered and the progression and compensation regulations applied accordingly.

- **Marking Schemes:** see appendices 1-6.

- **Progression Charts:** see appendix 6 and can be viewed at http://goo.gl/N492mp

- **BSc Degree Candidates**

Award of an Honours degree is dependent on completion and submission of a final year project.

When the overall Part I / Part II mark has been computed, it is rounded to provide a single overall integer mark before any degree classification is assigned. Subject to the exception of borderline candidates and those with extenuating circumstances, who may be awarded a higher degree classification, students shall be awarded the class of degree with their overall mark. The classes of honours degree are as follows:-

- First Class - average of 70%+
- Second Class (Division 1) - average of 60-69%.
- Second Class (Division II) - average of 50-59%.
- Third Class - average of 40-49%.

The standardised weighting for the stages of a Bachelor degree will be 33/67 for Parts I and II respectively, and the standardised weighting for an Integrated Master's degree (undergraduate) will be 20/40/40 for Parts I, II and III respectively.

Borderline Profiling

Classification borderlines will be based on the overall rounded average mark (credit and stage weighted). Borderline overall averages will be as follows:

2:1–1st	68, 69
2:2-2:1	58, 59
3rd-2:2	48, 49

A student should be given the higher class if either of the following criteria are met:

- Half or more of the final stage credits are in the higher class;
- Half or more of the final and penultimate stage credits are in the higher class

Further Reading

Full details of regulations can be viewed on the UoN Quality Manual page at http://goo.gl/qoQPi3

15 Extenuating Circumstances

Policy regarding extensions to coursework on grounds of Extenuating Circumstances, Disability or Specific Learning Difficulties Summary:

1) Extensions to coursework will not normally be given unless the student has a specific recommendation from the School's Extenuating Circumstances Committee, or Academic/Disability Support.
2) Extensions will not normally be given as a result of short-term illness of less than 7 days unless the module convenor agrees this.
3) Students with Academic/Disability referrals allowing the option for coursework extension may arrange for a short extension to coursework submission with the module convener, on the basis of particular circumstances, without the need to apply for extenuating circumstances.
4) Students with approved extenuating circumstances may be granted an extension to coursework submission of usually no more than 21 calendar days.

Full details of the school's implementation of University policy is below. Meeting deadlines is an important part of working life. It is important that students develop time management skills and the ability to meet deadlines before undertaking work placements or entering the workforce on graduation. Coursework deadlines are normally set at the start of the module by the module convenor[1], and clearly stated in module documents/introductory teaching sessions. This gives students the opportunity to identify periods of high workload within each semester and plan their time accordingly. Whilst course teams will try to adapt deadlines to avoid coursework 'hotspots', deadlines are set as appropriate for each individual module and it is the student's responsibility to plan their time accordingly.

Extensions to coursework deadlines can be given in limited circumstances – for example, if students have extenuating circumstances, disability or specific learning difficulties. These are dealt with in the following way.

- Extensions to coursework will not be given to students unless they have a specific recommendation from Academic/Disability Support, the School's Extenuating Circumstances (ECs) committee or the module convenor (see below).
- Students with specific recommendations from Academic/Disability Support may request one extension in advance of the deadline, giving justification for why they need it. Students should not expect to be offered an extension, and it is acceptable for the Module Convenor not to allow one, if it is not possible within the module structure – for example, if the work is subject to a very tight marking turn-around period, such as laboratory practical write-ups. In these circumstances, students should be given notice in advance of the deadline that no extensions can be allowed. If the module convenor feels that an extension is appropriate, the following extension lengths, which have been endorsed by Academic Support, will be followed:

Length of Coursework	**Extension**
Up to 2,500 words (or equivalent)	Maximum of 2 calendar days
2,500- 5,000 words (or equivalent)	2-4 calendar days
Final Year Dissertation	Maximum of 5 calendar days

[1] Where this guidance refers to "module convenor" this can also be taken to include coursework marker/other academic contributor to the module where this person is not the module convenor.

Any further extension would normally only be given on the basis of approved extenuating circumstances.

Any unapproved late submissions will have marks deducted as outlined in the Quality Manual (5% for each working day).

Students who submit coursework late as a result of illness or other circumstances lasting more than 7 days should discuss this with the module convenor or their personal tutor and should submit an EC form in advance of the submission deadline and evidence within 7 days of the submission deadline. If evidence is not available at the time that the form is submitted, it can be submitted within 14 days of the EC form submission. This documentation will be considered via the normal EC process (see: http://www.nottingham.ac.uk/academicservices/qualitymanual/assessmentandawards/extenuating-circumstances-policy-and-procedures.aspx

- If ECs are accepted, an extension to the submission will be agreed and any marks that have been deducted for late submission will be reinstated.

  Any extension (within a teaching semester) for students with ECs will not normally be for more than 21 calendar days, to ensure that all coursework is submitted prior to the coursework return date. Any submission after the return date will not be accepted but a student may be given a first sit opportunity if they have approved ECs.

16 Plagiarism and Paraphrasing

Plagiarism and Paraphrasing

This section is also covered in the Study Skills book. It draws upon information available at the following University Web sources together with guidance from staff in the School of Biosciences. **As work is now submitted electronically through Turnitin, be aware the plagiarism is readily-detected**.

USEFUL ADVICE FOR STUDENTS

One good method to avoid plagiarism is to make notes from material you have read and construct your essay / report, in your own words, from these notes. It is tempting (and easy) to copy and paste, but this is unacceptable and constitutes an academic misconduct. It is also poor practice to construct a draft by copying and pasting material from multiple sources, with the intention of then paraphrasing the resulting document. Apart from the fact that the end-product may be disjointed, the paraphrasing is often incomplete and the work submitted may contain elements of plagiarised material. It is, however, acceptable to include relevant figures and tables from published work, as long as you acknowledge their source by citing the primary reference for them.

To make a specific point, there may be rare occasions when you have may to quote an author verbatim; this is acceptable if you put the quotation in inverted commas and give the source, but you should have a good reason why you can't put the material in your own words.

USEFUL WEBSITES

Academic integrity and plagiarism
http://www.nottingham.ac.uk/studyingeffectively/writing/plagiarism/index.aspx

Quality Manual
http://www.nottingham.ac.uk/academicservices/qualitymanual/assessmentandawards/academic-misconduct.aspx

Studying Effectively
http://www.nottingham.ac.uk/studyingeffectively/home.aspx

DEFINITION OF AN ACADEMIC MISCONDUCT

Any activity or behaviour by a student which may give that student, or another student, an unpermitted academic advantage in a summative assessment is considered to be an act of academic misconduct and unacceptable in a scholarly community. Such action(s) will be considered under the University's Regulations on Academic Misconduct and this may lead to a penalty being imposed

DEFINITION OF PLAGIARISM

The following definition of plagiarism appears in the University Quality Manual:

Plagiarism: representing another person's work or ideas as one's own, for example by failing to follow convention in acknowledging sources, use of quotation marks etc. This includes the unauthorised use of one student's work by another student and the commissioning, purchase and submission of a piece of work, in part or whole, as the student's own.

Note: A proof-reader may be used to ensure that the meaning of the author is not misrepresented due to the quality and standard of English used, unless a School/Department policy specifically prohibits this. Where permitted, a proof-reader may identify spelling and basic grammar errors. Inaccuracies in academic content should not be corrected nor should the structure of the piece of work be changed; doing so may result in a charge of plagiarism.

Work in any year of study which is not undertaken in an Examination Room under the supervision of an invigilator (such as dissertations, essays, project work, experiments, observations, specimen collecting and other similar work), but which is nevertheless required work forming part of the degree, diploma or certificate assessment, must be the student's own and must not contain plagiarised material.

Possible **penalties** for an academic misconduct including plagiarism are:

a) No marks to be awarded in relation to the specific material which is the subject of the act constituting an academic misconduct (thus leading to a reduced overall mark for the piece of course work, dissertation, examination question or examination script in which the specific material appears)

b) Award a mark of zero for the entire piece of course work, dissertation, examination question or examination script in which the academic misconduct has occurred

c) Award a mark of zero for the entire module in which the academic misconduct has occurred

d) Award a mark of zero for all the assessments in the semester (even where this will lead to a reduction in degree class). In the case of year-long modules, this penalty may affect both semesters

e) Award a mark of zero for the whole year (even where this will lead to a reduction in degree class)

f) Require the student to take reassessments (as a result of being awarded zero marks) in the following session before being allowed to progress or complete their course

g) require the student to register with the University and enrol on modules in which they need to take reassessments (as a result of being awarded zero marks) in the following session before being allowed to progress or complete their course

h) Terminate the student's course

i) Withdraw the award of a degree or other qualification from, and issue an amended transcript to, a former student of the University

j) Full details of possible School and University penalties can be found at: www.nottingham.ac.uk/academicservices/qualitymanual/assessment/academic-misconduct.aspx

ACADEMIC MISCONDUCT

Any activity or behaviour by a student which may give that student, or another student, an unpermitted academic advantage in a summative assessment is considered to be an act of academic misconduct and unacceptable in a scholarly community. Such action(s) will be considered under the University's Regulations on Academic Misconduct and this may lead to a penalty being imposed.

Here is a range of cheating behaviours:

1. False citation (i.e. attributing work to the wrong source)
2. Plagiarism
3. Using unauthorised sources or notes in examinations or tests
4. Dishonestly obtaining material or information prior to examinations
5. Copying from other students
6. Permitting other students to copy your work
7. Soliciting work from others (e.g. individuals, 'editors' or essay banks etc)
8. Submitting your own previously assessed work without acknowledgement (auto plagiarism)

Unauthorised Collaboration, or Collusion, occurs where:
Collusion: cooperation in order to gain an unpermitted advantage. This may occur where students have consciously collaborated on a piece of work, in part or whole, and passed it off as their own individual efforts or where one student has authorised another to use their work, in part or whole, and to submit it as their own.
Note: Legitimate input from University tutors or approved readers or scribes is not considered to be collusion.

Fabrication may take various forms but is essentially concerned with manufacturing aspects of the work produced. For example, the insertion of made-up information, data, sources, quotes, anecdotes or analysis would all amount to fabrication

Recycling or unauthorised, multiple submissions.

The multiple submission by a student of their own material is not, in itself, considered as academic misconduct. Submission of material that has been submitted on a previous occasion for a different summative assessment is, however, unlikely to be academically appropriate. The merit of such material will therefore be a matter of academic judgement and it may attract fewer (or no) marks than would have been the case if it had not been assessed previously

Note:
Plagiarism is regarded as a serious academic misconduct by the University and will be penalised accordingly. Plagiarism can be easily identified by entering suspect passages into search engines. Specialist search engines (e.g. Turnitin) are available to check all submitted work against previously published sources, including coursework submitted by students in the current or previous years. The School of Biosciences uses Turnitin to assist academic staff detect plagiarism; students are required to submit all coursework in electronic form to facilitate automatic on-line detection of plagiarism.

All BSc Research Projects must be submitted electronically to be checked by Turnitin along with the necessary hard copies (see Guidelines for BSc Research Projects).

If a student is required to attend an Academic Misconduct interview within the School for any suspected academic misconduct his/her tutor will be informed of this, together with the Head of School (or nominee), module convenor (or nominee) and the School Manager for Academic Administration (or nominee.

GUIDANCE TO HELP YOU AVOID COMMITTING PLAGIARISM

1. You are allowed to use information from other people's work provided you acknowledge the source. This can apply to a statement, Table or Figure. The best way of doing this for Tables and Figures is to add: "After Smith (1988)" or "Modified from Smith (1988)", and include the reference in your reference list.

2. If you are discussing something somebody else has said, you can say, for example: Smith (1987) claimed that coral reefs in the Pacific were damaged by high temperatures in 1975. Or: It has been claimed that high temperatures in 1975 damaged coral reefs in the Pacific (Smith, 1975).

3. It is rarely necessary to quote previous work directly and you should try to avoid doing this. If quotation is unavoidable, you should put the passage in quotation marks, e.g. Smith (1980) described the outcome of unprecedented high temperatures on coral reefs as: "A disaster for the marine communities in the coastal regions of the Indo-Pacific", and then stated that: "The phenomenon appears to be due to unprecedented high temperatures".

For information on paraphrasing see 8 and 9 below.

4. Authors should be cited in text either as: Smith (1975), Smith and Allen (1978), Allen (1987, 1989), or as (Smith, 1975; Smith and Allen, 1978; Allen 1987, 1989). Note that these are in chronological, not alphabetic order. When more than two authors are quoted, this should be in the form Allen *et al*. (1993) in the text, but the reference given in your reference list should contain the names of all the authors. Do not use numerically cited or ordered references.

5. In your "References" or "Literature cited" section, the following style (authors, date, title, journal, volume number, page numbers; called the "Harvard" style) should be used and references should be listed alphabetically.

   Provided you are consistent, you may also use any other accepted style - see journals in the library – unless instructed otherwise by the member of staff setting the coursework.

   Smith, A. J. and Allen, N. B. (1986). Temperatures and coral reefs. *Journal of the Marine Biological Association* 86: 101-123.

   Smith, A. J., Jones, K. L. and Allen, N. B. (1988). Death of corals due to high temperatures. *Thermal Biology* 27: 19-34.

   If the source is only available electronically or is being published "ahead of print", give the DOI number in your reference.
   Some electronic journals do not use page numbers.

6. For books, the following style (author, title underlined or in italics, publisher, place of publication) applies:

Allen, N. B. (1992). *Coral Reef Biology*. Blackwells, London.

7. For chapters in edited volumes, the following style (author, date, title of chapter, title of book underlined or in italics, editors, page numbers, publisher, place of publication) applies:
Smith, A. J. (1987). Temperature and bleaching in corals. In: *Coral Reef Biology* (N. B. Allen and C. K. Hodges, eds.), pp. 65-90. Clumber Press, New York.

8. **Paraphrasing**, i.e. verbatim or almost verbatim restatement of a passage is a form of plagiarism frequently used in essays and dissertations. The following is paraphrased from C. H. Gordon, P. Simmons and G. Wynn (date unknown). *Plagiarism - What It Is And How To Avoid It*. University of British Columbia.

   Students often ask "How much do I have to change a sentence to be sure I'm not plagiarising?" If you have to ask, you are probably about to commit plagiarism! There is no set number of words that you need to change or add to make a passage your own – the originality must come from the development and expression of your own ideas.

   Original work demands original thought. You should try and separate your ideas from those of others. If you use another author's conclusions then acknowledge them. If you come to the same conclusions as another author you should still acknowledge them. Once a piece of work is complete, look at each part and ask yourself if the ideas expressed are entirely your own, and whether the general language or choice of words is your own. If the answer to either is "no" the work should be credited to the original author.

9. Examples

9.1 Original

From Smith (1992):
The author has found that corals respond to high temperatures by expelling their zooxanthellae. This causes them to go white, a phenomenon known as "bleaching." Such corals soon become covered in algae, which makes it difficult for new coral planulae to settle and start a new colony (Davies, 1980). The phenomenon of bleaching is similar to the effect of a crown-of-thorns starfish (*Acanthaster planci*) attack where the polyps are digested by enzymes secreted onto the colony surface (Brown, 1990). As Jones (1972) found, *A. planci* poses a severe threat to corals in the Indo-Pacific. The recent occurrence of high numbers of these starfish on reefs has been correlated to run-off from land which contains high levels of plant nutrients (Jones, 1986). The subsequent increase in the number of algae apparently enhances the survival of the filter-feeding larvae of the starfish.

To include this text verbatim in your own work, *without* placing the entire paragraph in quotation marks and acknowledging Smith (1992) (see 3 above) would constitute plagiarism.

9.2 Paraphrased version

Paraphrased from Smith (1992):
Smith (1992) has found that corals respond to high temperatures by expelling their zooxanthellae. This phenomenon, known as "bleaching", causes them to go white. Such

corals quickly become covered in algae and this makes it difficult for new coral planulae to settle and begin developing a new colony (Davies, 1980). Bleaching is similar to the effect of a crown-of-thorns starfish (*Acanthaster planci*) attack. Brown (1990) note that this is where the polyps are digested by enzymes secreted onto the colony surface. Jones (1972) found that *A. planci* may be a severe threat to corals in the Indo-Pacific. Recently high numbers of these starfish on reefs has been correlated to run-off from land with high levels of plant nutrients (Jones, 1986). The increase in the number of algae apparently enhances the survival of the filter-feeding larvae of the starfish.

To include this text in your own work, even *with* the initial acknowledgment Smith (1992) would constitute plagiarism since it reads as if only the first sentence is taken from Smith, and the rest of the references (Davies, Brown and Jones) have been sourced and read by you and that the development and expression of the text is your own original work.

9.3 Unacknowledged version (i.e. submitting this as if it were your own thoughts or work)

The presence of high numbers of crown-of-thorns starfish (*Acanthaster planci*) on reefs has been connected to run-off from land containing high levels of plant nutrients. This causes an increase in the number of algae which results in better survival of the filter-feeding larvae of the starfish. The starfish kills corals by secreting digestive enzymes onto their surfaces. *A. planci* poses a severe threat to corals in the Indo-Pacific and their effect is similar to that caused by "bleaching", a phenomenon caused by high temperatures which results in zooxanthellae being expelled. Subsequently the dead corals become covered in algae which makes it difficult for a new colony to start.

To include this text verbatim in your own work, would constitute plagiarism since there is no acknowledgment of Smith (1992).

9.4 Acceptable version (based on information from Smith, reading the cited references yourself and drawing upon other work)

Smith (1992) quoted Jones (1972, 1986) in suggesting that the crown-of-thorns starfish poses a threat to corals in the Indo-Pacific, and that their recent upsurge may be due to an increase in plant food levels caused by an input of nutrients from land. Brown (1990) found that these multi-armed starfish killed corals by everting their stomachs onto the coral colony surface and secreting an enzyme to digest the tissues externally. The resulting "bleaching" effect is similar to that which occurs when corals are exposed to high temperatures and the zooxanthellae are expelled (Smith, 1992). Davies (1980) found that the settlement of algae on the colony surface made it difficult for new coral larvae to settle and, although fish often grazed the algae continually, he found they could not keep these under control. Recent studies have shown that plagues of crown-of-thorns starfish may be a natural phenomenon, as the fossilised remains of previous outbreaks have been found in rocks millions of years old (Cromer, 1994).
To present your work like this would not constitute plagiarism.

Note that all the references and authors used in this document with the exception of Gordon *et al*. are fictitious.

PLEASE CONSULT YOUR TUTOR IF YOU ARE STILL IN DOUBT ABOUT PLAGIARISM

17 Personal Academic Development

This table sets out the goals that you should strive for as you progress through your degree. If you can achieve these you will be well prepared for the diverse opportunities that lie ahead

	Qualifying year **Year 1**	**Part I** **Year 2**	**Part II** **Year 3**
Learning experience	• Establish a strong factual base • Learn the basics of the scientific method and develop a questioning approach	• Link knowledge from diverse sources and develop an ability to relate information • Develop a critical and analytical approach to information	• Develop the ability to handle complex information • Evaluate information and synthesise ideas • Develop a creative approach to problem solving
Skills acquired	• Cope with varying lecture styles • Make effective use of library and IT facilities • Acquire basic laboratory skills	• Consolidate information skills with extensive use of library and IT • Enhance practical skills • Enhance presentation skills • Organise study and manage time to meet deadlines • Appreciate the importance and value of team work	• Develop a mature approach to study • Exhibit strong self-discipline and commitment • Clearly articulate knowledge and understanding • Respect the views of others and engage in reasoned argument
Developing independence	• Learn to combine teacher-driven study with work based on individual initiative	• Make independent use of library and other information resources • Acquire experience in a range of learning styles	• Take responsibility for self-learning • Demonstrate individual style and flair • Exhibit professionalism and ownership of subject

18 Academic Tutoring

Academic tutoring is the support which the school provides to students in addition to formal teaching. It is complementary to the University's central support services and pastoral care provision.

The objectives of Academic Tutoring are to:

- Help you acquire the necessary study skills to pursue your studies successfully.
- Address problems of lack of knowledge and understanding of the subject.
- Address any problems with aspects of a module or your studies in general.
- Provide you with an overview of your academic progress at module and programme level.
- Assist you in making academic choices e.g. module enrolments, programme pathways.
- Provide assessment feedback to help you improve your future performance.
- Contribute to the acquisition of key employability skills.
- Assist and encourage you to gain employment or continue your education after you graduate.

The School takes its responsibility for academic tutoring very seriously and provides the following to ensure that you are properly supported:

- One-to-one meetings with your personal tutor for personal development, pastoral support and guidance (e.g. on module choices).
- Meetings with course directors for module guidance, either informally or at module enrolment days.
- Tutorials/seminars within modules comprising your degree programme.
- Provision of specific credit-bearing academic tutoring and study skills modules D21BG1: Biosciences Tutorials (Academic Development) and Foundation and, C11BE1 Dissertation in Environmental Science and also through skills embedded in other academic modules including project and dissertation modules.
- Drop-in support sessions for mathematics and statistics.
- Written feedback on assessments including;
  - individual written or verbal feedback on coursework and mark allocation based on a transparent marking scheme,
  - generic feedback one week after exam results,
  - constructive comments provided by markers through individual appointments with module conveners
  - students' evaluation forms collated from students' comments, available through Moodle.
- Student led-seminars.
- Peer support groups, including mentoring.
- 'Office hours' system for appointments with module coordinators/tutors.
- A flexible and comprehensive virtual learning environment (Moodle).
- Links to central support services e.g. Academic Support, the Counselling Service and the Student Services Centre.
- Assistance and guidance on academic administrative matters through the school office.
- Encouragement to make use of central on-line study skills resources e.g. 'Study Skills' www.nottingham.ac.uk/studyingeffectively
- Assistance with personal support or guidance from the School Senior Tutors.

School of Biosciences Tutoring Statement

The full Biosciences tutoring statement can be found in appendix 8 and at http://goo.gl/dPpFjU Students are encouraged to read the statement.

19 Attendance Monitoring

Students must attend all teaching activities necessary for the pursuit of their studies, undertake all associated assessments and attend meetings and other activities as required by their School or the University. Where students face difficulty in attending sessions or undertaking assessments and examinations, it is their responsibility to inform their School of this fact and to provide a satisfactory explanation. Please see http://www.nottingham.ac.uk/academicservices/qualitymanual/registrationattendanceandstudy/regulations-governing-attendance-and-engagement.aspx for further details on attendance regulations at the University.

Two weeks is considered a significant period of absence and students are encouraged to consider interrupting their studies if they will miss this length of time. See for further details on voluntary interruption of studies.

The School will consider all extenuating circumstances relevant to attendance and engagement with a student's studies. Students should make the School aware of any extenuating circumstances as soon as possible to ensure full support can be provided and any alternative arrangements such as coursework extensions can be applied within the approved timescales. See the Quality Manual http://goo.gl/yX4aTC or further details on extenuating circumstances.

Individual Schools and Departments have systems in place to monitor attendance during the academic year. Example includes taking registers in lectures, monitoring coursework submission and tutorial attendance, etc. Unauthorised absences are reported to Academic Services and recorded as appropriate. Where students are absent without authorisation, to the point that it is not possible to continue with the course, Academic Services will write to the student stating that they will be deemed to have withdrawn from the University and their student record will be amended to show that they have withdrawn.

Students who are identified to be poorly engaging with their studies or poorly attending teaching activities will be asked to meet with the Student Experience and Support Officer or their Personal Tutor.

Where required the University will report non-attendance and poor attendance to appropriate authorities including the UK Border Agency and Student Finance.

20 Complaints and Appeals Procedures

Details of the University's Complaints and Appeals Procedure can be found at:
http://www.nottingham.ac.uk/academicservices/qualitymanual/assessmentandawards/academic-appeals-policy-and-procedure.aspx

The procedure regarding a complaint concerning your course is that in the first instance you should contact the lecturer concerned. If the matter cannot be resolved, the next points of contact would be:

- Module Convener
- Course Director
- Teaching Manager
- Head of Division
- Head of School
- Student Year Representative (names are on the Learning Community Forum notice board together with the Module Convener)

Students are encouraged to involve their Personal Tutors at any stage, whether the matter of concern is of an academic or personal nature. Students also have the right to bring matters of concern before Learning Community Forum.

21 Industry Placements

As an undergraduate student in the School of Biosciences, the vast majority of you can undertake an optional industry placement, between years two and three of your degree, extending your degree to a four year programme.

The year-long placement is open to you if you are studying one of the following degree programmes:

- BSc Agriculture
- BSc Integrated Agricultural Business Management with Industrial Placement Award [1]
- BSc Agricultural and Crop Science
- BSc Agricultural and Livestock Science
- BSc International Agricultural Science [2]
- BSc Animal Science
- BSc Biotechnology
- BSc Environmental Science
- MSci Environmental Science [3]
- BSc International Environmental Science [2]
- MSci International Environmental Science [2 3]
- BSc Environmental Biology
- BSc Food Science
- BSc Microbiology
- BSc Nutrition
- BSc Nutrition and Food Science
- BSc Plant Science

You apply for placements during your second year. The School Placement Team help and support you by organising a range of employer presentations on campus, sending email alerts of placement opportunities, running drop-in sessions and one-to-one meetings, and providing online resources.

Further information, profiles of student experiences and useful links can be found here: www.nottingham.ac.uk/biosciences/placements

If you have any questions or want to find out more, contact the School of Biosciences Placement Team, Dr Judith Wayte and Mrs Rachel Jessop, on biosciplacements@nottingham.ac.uk

[1] If you are studying BSc Integrated Agricultural Business Management with Industrial Placement award, then a year-long industrial placement during year 3 is built into the 4 year degree programme.

[2] If you are studying a degree with an international pathway where you study abroad at the University of Sydney for your second year, you can still undertake an industrial placement. You will need to apply for your placement whilst studying in Sydney. You should be aware that some companies will require you to attend an interview/assessment centre in person, whereas

others will be more flexible and will be able to interview you remotely. You can work together with the School Placement Team by email from Sydney.

[3] If you are studying for an MSci degree course, adding a year in industry will mean that the total length of your degree course is 5 years. If you are an international student on an MSci degree course studying in the UK on a Tier 4 visa, and you wish to undertake a year in industry, you need to be aware of the following:

- Once you have secured an industrial placement, you will need to change degree course and apply for a visa extension.
- You may need to make your application for a visa extension from overseas.

The maximum length of time you can study in the UK on a Tier 4 visa at undergraduate level is 5 years. An MSci course with a year in industry is therefore at the maximum length, so if you were to fail one or more modules, you would not have the opportunity of resitting a year in the UK.

If you have any questions or want to find out more, contact the School of Biosciences Placement Team, Dr Judith Wayte and Mrs Rachel Jessop, on biosciplacements@nottingham.ac.uk

21.1 Year Out and Erasmus

The School of Biosciences has established an ERASMUS programme of Student Exchange with a number of European Institutions in France, Germany and Spain.

All students taking honours degrees in the School (except MNutr) are able to take an additional Certificate in European Studies (normal entry requirement is at least a grade B in the second language that the student intend to improve at GCSE level). The Certificate consists of an additional year over and above your 3-year BSc degree programme and commences after the second year in September of Semester 5 and concludes at the end of Semester 6. You will then re-join the normal 3-year programme at the beginning of Semester 7.

Students entering the School need to apply to take the Certificate following a meeting which outlines the principles of the Certificate. Once the application is confirmed, students must submit their application in writing to the School Office.

Students taking the Certificate follow preliminary language training during Year 2 (Part I) by taking 10 credits of French, German or Spanish languages (held in the Language Centre, University Park) and 50 credits of Science modules in each of semesters 3 and 4. In Semester 5 and 6; students will be on placement in an academic Institution in another European country where they will follow courses, including language modules in both of the semesters in placement; the courses must be taken in the language of the chosen Country. Students will also need to complete a European Placement module during semester 5 and 6.

The ERASMUS programme is on an exchange basis. Thus it is suggested that students make contact with ERASMUS students within the School who are from the host University together with those Biosciences students who were at the host University in the previous year. Both these contacts can be invaluable in providing assistance and information.

Further information about the scheme is available from Ms Elena Staves (Student Services Centre, The Barn) or Rachel Jessop (C05, Bioenergy and Brewing Science Bldg, SB).

SUPPLEMENTARY REGULATIONS FOR THE EUROPEAN CERTIFICATE

In addition to the normal progression rules for undergraduate study, the following progression rules apply to the European Certificate element.

Part I candidates achieving a mark of 50% or more in each of the Autumn and Spring Semester language modules will progress to the language module in the Autumn of the year of the Certificate in European Studies (Biosciences). Part I candidates achieving a mark of 40-49% in the Autumn and/or Spring Semester language module(s) will normally be advised to discontinue with the Certificate in European Studies (Biosciences). Candidates achieving a mark of less than 40%, at first attempt, in the Autumn and/or Spring semester language module(s) will be advised to discontinue with the Certificate in European Studies (Biosciences). If, after reassessment, candidates do not achieve a mark of at least 50% in the Autumn and/or Spring Semester language module(s) they may not continue with the BSc with a Certificate in European Studies (Biosciences).

The above regulations as specified for candidates obtaining marks at first attempt. Candidates on the year of the Certificate in European Studies (Biosciences) between Part I and Part II who obtain a mark of less than 40% in the language module cannot progress onto placement in the following semester. Such candidates are offered the opportunity either:

1) to transfer to the equivalent 3-year BSc degree without European Studies at the start of the next academic year and thus do not take any further language modules.

or

2) to be reassessed in the Autumn Semester language module in the August / September reassessment period.

If, after reassessment, a mark of 50% or more is achieved candidates may re-join the Certificate in European Studies (Biosciences) in the following academic year. If a mark of less than 50% is achieved at reassessment candidates will be offered 1) above.

In order to proceed to Part II of the degree BSc with a Certificate in European Studies (Biosciences) candidates must attain pass marks in assessments related to the European Year. Candidates who fail to attain satisfactory marks in the assessment undertaken during the European Year shall be offered the opportunity to transfer to the 3-year equivalent BSc degree without European Studies.

Candidates who fail to achieve the criteria for progression onto the three year equivalent degree without European Studies shall not be permitted to continue on this degree but may be offered the opportunity to transfer to the Ordinary degree.

MARKING SCHEME FOR THE EUROPEAN YEAR

European Placement Module:

Fifty percent of the mark correspond to the attendance and assessment of the courses taken abroad. The other fifty percent correspond to one scientific review, one cultural essay and one translation (see below for information).

50%: Attendance and assessment of courses taken abroad.
50%: Essays and translations.

Activity Type	*Information*	*Length*	*Weighting*
Attendance and assessment of courses abroad	Students must attend and sit the exams abroad	Not applicable	50%
Essay 1	Scientific review	4000 words	17%
Essay 2	Culture research paper	4000 words	16%
Translations	Science into English	10 * 400 words	17%

21.2 Studying Outside the UK

Malaysia Campus

Students on the BSc Biotechnology, BSc Agricultural and Crop Science, BSc Nutrition, BSc/MSci Environmental Science, BSc Environmental Biology and BSc Plant Science courses may have the opportunity to study for one semester or full academic year at our Malaysia Campus as part of their three-year degree programme. All teaching at our Malaysia Campus is in English and the modules and exams are very similar to those in Nottingham. Students from the UK campuses pay a reduced tuition fee during their time abroad and living costs in Malaysia are lower than in the UK.

See link: www.nottingham.edu.my/index.aspx

Universitas 21

Nottingham is a founder member of Universitas 21 which is a global alliance of key universities. You will be able to apply to spend one semester (the first of your second year) studying in one of our partner institutions (including Australia, China, Korea, Mexico, North America, New Zealand, Singapore). Competition for these placements is high but the rewards are considerable.
Find out more about study abroad opportunities at
www.nottingham.ac.uk/internationalstudents/exchanges/index.aspx

Interested? What to do next

Don't miss the Study Abroad Fair, organised by the International Office, which will take place in November 2016. Here, you will learn about all the study abroad options open to you and how to apply. You will also be able to meet with students who have already studied at overseas campuses.
Interested students are advised to find the Study Abroad Team on Facebook to be kept updated with deadlines and events at: www.facebook.com/UoNStudyAbroad and the International Office website:
www.nottingham.ac.uk/internationalstudents/exchanges/index.aspx

22 Channels of Communication

Dissemination of information is an on-going process during the academic year; this will come from both the School Office and academic staff. We use several ways to give out information.

- **Email -** Email is the normal means of communication to individuals or class groups; your tutor and module conveners will email regularly and it is also a good way for you to contact academic staff. However, this and other media should not detract from personal meetings, which are necessary for the communication of several matters including the conveyance and discussion of examination.

- **Moodle** - Moodle is the online learning environment across the University. The resource allows you to access lecture notes, find links to external learning resources, access self-test exercises and assessments, participate in online learning activities, submit assignments and collaborate on group projects. You can log in using your University username and password the day after you have completed your registration online. w: moodle.nottingham.ac.uk

- **The Student Portal -** The Portal is a central part of the University's communication system for staff and students. Make sure you have access to it at: https://goo.gl/dFwTwP

- **Social Media -** The University of Nottingham uses the latest technology to bring Nottingham to life and to ensure that you can experience and interact with the University community at any time, see: www.nottingham.ac.uk/connect/nottinghamconnect.aspx

- **Blue Castle website -** students can view their marks, progression status and final award information electronically at: https://goo.gl/txm85c

23 Students/Staff Consultation

The courses you are taking have evolved over a number of years and incorporate many features arising from student feedback and evaluation. Each department has its own procedures for allowing students to participate in the evaluation and future development of courses.

Broadly, two channels exist:

- feedback evaluations which enable you to comment on the content, style and objectives of modules; we urge you to take the time and effort to complete these so you and future students can play a role in improving our teaching

- The Learning Community Forum (LCF) consists of course representatives of undergraduate students and teaching staff who discuss a wide range of academic and non-academic matters. Anyone who has comments, criticisms or suggestions that they wish to be discussed should contact one of the representatives, whose names will be notified to you during the first semester. Minutes of the Learning Community Forum will be made available electronically.

- The Student Guild also elects student representatives to the School Board and other School committees. If you want to influence academic procedures in the School and University on behalf of your fellow students, you must join the Guild first.

24 Students' Access to Academic Staff policy

Appointments for meetings with staff should be requested by students by email or in person (by phone or office notice board). Requests by email can be made at any time. Staff should respond to such requests by email within two working days (both during term and outside term-time). Staff are not obliged to send their responses outside of normal working hours, nor during official University holidays, nor when on vacation. They should put out-of-office messages on their emails during vacations and respond within two working days upon return.

Following a request, appointments should be arranged with the student at a mutually convenient time, normally to be held within three working days of the request.

Once an appointment has been made, both the staff member and the student are expected to honour the appointment. Should either be unable to attend they should email to cancel prior to the meeting.

Staff have the option of restricting their availability to students to particular days or times of day (other than in emergencies). In this case, they will communicate their preferred availability to their tutees and to other students they see on a regular basis.

25 Quality Assurance

The primary aim of the University of Nottingham is to sustain and improve the high quality of its provision as one of the leading research-led universities in the United Kingdom. It is also committed to providing a learning environment of the highest quality for students, in which first class teaching is underpinned by excellent research. The School of Biosciences endeavours to maintain these goals in the Biosciences, where relevant in collaboration with other schools, in the following ways:-

- by recruiting motivated students with a proven record of high level of learning;
- by providing a broad education across the discipline;
- enabling the development of an analytical and critical appreciation of scientific ideas and problem solving;
- providing a learning experience enriched by an active research environment;
- enabling the development of independent learning and skills for a wide range of careers within and outside the biological sciences;
- to ensure that students receive appropriate support and guidance in their academic development and career planning;
- to identify and support the academic and pastoral needs of individual students;
- to provide a flexible, effective and adequately resourced learning environment, and
- to maintain and improve teaching and learning through effective management structures in line with the University Quality Manual.

As part of an ongoing process of improving quality, some of our teaching facilities have been recently refurbished and modernised. We look to our students to help us maintain these areas in good condition for the benefit of future generation.

26 Coursework and Examination Feedback

Feedback is provided in three main forms on i) assessed coursework, ii) examination performance and iii) general aspects of each module. In addition to individual marks given for assessed coursework in each module, you will receive an overall module mark and the end of each semester and a full set of module marks will be made available to you through Blue Castle (https://bluecastle.nottingham.ac.uk). Your module marks are confidential and not shown to other students. Individual mark components (e.g. coursework marks) are also confidential; the only exception to this is when you receive a mark for a piece of 'group work' in which all members of your group receive the same mark. The sections below provide further details about feedback.

Coursework Feedback

Coursework feedback is normally provided through written comments on your work. For many pieces of coursework, a cover sheet will be returned with your work to explain the mark received and give advice on how your work could be improved. For other pieces of non-examination assessed work, it may not be feasible to provide written comments on your work, for example, a group oral presentation; in such cases, feedback may be provided verbally or by email. Feedback for other assessed work e.g. laboratory practicals, may be provided in other ways as appropriate to the assignment set. Whilst the manner by which you receive coursework may vary depending on the type of coursework set, the purpose of the feedback is to provide a mark for the work together with constructive comments to help improve your performance in future assignments. If you wish to discuss your performance in any assessed work, you should contact the module convenor.

Module convenors will set a deadline by which you must submit coursework and a date when you can expect to receive feedback on your work. This information will be provided when the module convenor sets the piece of work. In normal circumstances, marked coursework and associated feedback should be returned to students within 21 days of the published submission deadline, i.e. students submitting work before the published deadline should not have an expectation that early submission will result in earlier return of work. See details www.nottingham.ac.uk/academicservices/qualitymanual/assessmentandawards/feedback-to-students.aspx

Examination Feedback

After each examination period, general examination feedback from each module will be posted on Moodle. This will include: i) feedback on examination questions where students' performance could be improved, ii) suggested strategies for improving performance in those questions and iii) general comments about examination technique. Students wishing to discuss their examination performance should contact the relevant module convenor(s).

General Feedback

A copy of the Module Report Form, which is a summary of the discussion/feedback with students at the end of each module, can be found within a folder for the module in Moodle. This feedback sheet is used by module convenors to identify which areas of the module students felt worked well, and others that could be improved; in the latter case, the module convenor will make appropriate academic adjustments to the module for the following academic session. The areas of feedback covered by the module report form follow the headings detailed in the Module Report Form.

The University's Quality Manual provides information on good practice for feedback on assessed work and what you can expect to receive as a student at the University of Nottingham – see http://goo.gl/DI1Gqo.

27 Student Services/departments

27.1 Student Services Centre

The Student Services Centre can provide you with information and support throughout your student life. They are approachable, knowledgeable and most of all they are there to help. Student Services Centres are based at Sutton Bonington, University Park, QMC and Jubilee Campuses. Further details of support services to be given to you on arrival.

27.2 Libraries

The James Cameron-Gifford Library on SB Campus, together with Hallward Library (at UP), George Green Library (UP) and the Medical School Library (QMC and Derby) provide information on all subject areas covered by the School, plus study areas and computing facilities. The on-line catalogue (NUsearch) enables you to search for material held at all branches of The University of Nottingham library. Material from the other campuses can be obtained swiftly for you through the intersite delivery service. During Semester 1 you should attend an introductory lecture provided by the library's Teaching and Learning Support Team. This will be followed up by a tutorial providing an introduction to key resources and discussion on the critical interpretation of published materials as part of the Academic Development and Employability module.

Learning these basic information retrieval and evaluation skills is essential - you will need them for essays and projects throughout your course. As you progress, more specialised studies are undertaken and you must become familiar with the experimental data published in various journals. Acquaintance with published research provides the foundation for most final year research projects. You should not forget to read the more popular scientific press such as *New Scientist* or *Scientific American*, as well as those appropriate to your discipline.

The James Cameron-Gifford Library at Sutton Bonington has over 100 reading places, including quiet areas, bookable/non-bookable study rooms and a number of PCs (see below); it links with several of the Computer Rooms. The Library stock has been developed to support teaching and research in the Schools of Biosciences and Veterinary Medicine, and the library service also provides access to a wide range of databases, electronic journals, and e-books.

Your University Card is also used as a Library borrower's card, and is required for entry to the libraries at University Park campus.

The James Cameron-Gifford Library is open
Monday to Friday 8.00 am 9.45 pm

Saturday 9.00 am - 4.45 pm
Sunday 9.30 am - 4.45 pm

The library is open 24/7 during exam periods. More information can be found on our website at: www.nottingham.ac.uk/library

27.3 IT Facilities

Help and advice

Advice and information for new users of the IT facilities can be found on the University web pages – go to www.nottingham.ac.uk and search for 'Student Essentials'. Several on-line guides can be found, and many of them are available as hard copy booklets in the libraries.

Getting online

Your username and password will get you access to most of the services you will need during your time at the University. Make sure you set a strong password and *never* share your password with someone else. The University will *never* ask you to reveal your password, and you should be suspicious of any request to tell someone your password.
Be sure to check your University email regularly, otherwise you may miss important information.

Computer rooms

There are a number of Information Services (IS) computer rooms on the Sutton Bonington campus which can be used by students, but some are also used for teaching classes. Please look out for notices stating times when the rooms are unavailable due to teaching bookings

There is a large (120 seat) computer room in the Gateway building (room A07); and smaller rooms in the Main Building (rooms B05, B08, B09, and B10). Further computers are available in the James Cameron Gifford Library, including some with large screens for collaborative or group work.

All IS Computer Room computers are set up in an identical manner, with the same selection of software installed or available (Windows, Microsoft Office, EndNote, PDF Creator; and a range of statistical, graphical and course-related software applications).

Computer loans

The JCG library counter offers a short-term laptop and tablet loan service, with loans restricted to use within the Library and Learning Hub areas only.
Students may also make use of the Information Services Laptop Loan service, where longer-term loan periods are possible. This service operates from an office at University Park (Pope Building).

The Portal; and Virtual Learning Environment

The **Portal** (linked from the University's home page) is the main point of access for students, through which you can access most of the services you will need. From the Portal you can connect to your email service, module information, Library services, timetables, and other essential information. You can also connect to **Moodle**, which is the University's Virtual Learning Environment (VLE), and is where you will find course information, module documents, lecture notes, reading lists, assignments, etc.

Saving your files and backing up your data

It is the responsibility of each student to save their work safely and securely! Each student has 4GB of personal file storage available on the University's networked servers. This is

available as the 'Home Drive' from any IS Computer Room computer, as well as via the web at files.nottingham.ac.uk.

Never save your work onto the hard drive of Computer Room computers – files will be deleted when you log off! Save files to the Home Drive or to an external device.

Any work done on your *own* computer should be backed up – either onto *at least* one external hard drive or onto one of a number of cloud storage options available widely.

Printing

Students can print from any IS computer to the University Print Service. Printing is held in a queue and can be printed off and collected at Print Service printers which are situated close to all IS computer rooms and in the libraries.

You can also print from your home computer, laptop or mobile device using the Mobile Print Service. Simply email your document to mobileprint@nottingham.ac.uk

Wireless

Good wireless coverage on the **eduroam** service should be available in all of the main teaching and social areas of the campus, and in some outdoor areas. In the halls of residence the wireless service is provided by the Hall management companies.

27.4 Accessibility

Teams supporting students with study support, disabilities, specific learning difficulties and long term health conditions are located in the Student Services Centre (SSC), in The Barn on Sutton Bonington Campus, in the Portland Building on University Park, and will be available on all of our other teaching sites.

We can assist with queries regarding:

- Support in making the transition to University, admissions and registration
- Liaison with your School or department about any impact your condition may have on the study elements of your course OR: assessments in relation to disability and dyslexia and recommendations to academic staff about reasonable adjustments in the learning, teaching and assessment environments
- access to alternative formats such as Braille and large print
- residential accommodation – adapted study bedrooms
- accessible transport around and between our Nottingham campuses
- applying for Disabled Students' Allowances
- access to alternative formats such as Braille and large print
- access to specialist technology in libraries
- liaison with libraries for enhanced services such as extended loans
- timetabling arrangements

The Accessibility Team also provides support for students who wish to develop their strategies for academic writing and time management.

The Accessibility Team have online study resources which relate to almost all of the areas you cover in the guide, see
http://www.nottingham.ac.uk/studentservices/supportforyourstudies/academicsupport/studyresources/index.aspx

If you would like to contact us please phone the Student Services Centre on
(0115) 951 3710
e: disability-support@nottingham.ac.uk
dyslexia-support@nottingham.ac.uk

The University of Nottingham ACCESS Centre (UNAC), in the Student Services Centre, provides assessments for students who have applied for Disabled Students' Allowances.

Student Welfare Manager
The School also has a dedicated Student Welfare Manager, who provides a point of reference, advice and guidance for members of staff and students in the School about student disability issues and student support. The Welfare Manager is part of a large cross campus team of Student Welfare support managers and officers that meets regularly to share information and good practice. The Welfare Manager in Biosciences works closely with the Accessibility Team in working to ensure that all students are supported and advised appropriately and that there is equality of opportunity for all.

If you have any requirements or concerns talk in the first instance to your Welfare Manager – or contact your personal tutor.

School Welfare Manager

The Welfare Manager for the School of Biosciences is located in the Main Building. You will be meet your Welfare Manager during your induction and will be given further details on your arrival at university.

27.5 Careers and Employability Service

Careers and Employability Service

Many first year students think it is too early for them to start thinking about their future career, but in our experience it is never too early. By making the most of your time at university you can develop skills and build experiences that will be of interest to your future employers.

You could:
- join a **society** or **sports team**
- complete an **Advantage Award** module
- find a **part-time job** through Unitemps.

For more information about the Advantage Award, Unitemps or other ways to make the most of university life you can visit our webpages www.nottingham.ac.uk/careers or speak to a member of the careers team.

Whether you have one or several career ideas or none at all, it is a good idea to start researching possible career options. There are a number of ways the Careers and Employability Service can help you to do this:

- Speak to a Careers Adviser. You can book a one-to-one appointment to discuss your career ideas or questions at Sutton Bonington Campus or at University Park.
- Meet employers on campus. Throughout term time there will be a range of different employers visiting Sutton Bonington Campus and University Park. While you're in your first year you can attend these events to find out about different industries and companies, which will help you with your career planning.
- CV Reviews. Whether applying for work experience, a summer internship or a part-time job you can have your own CV reviewed at Sutton Bonington Campus or University Park.

To book an appointment or CV review, or to book a place at an employer event or workshop visit: www.nottingham.ac.uk/careers/login

To find out about the workshops and events, check your university email to find your weekly Biosciences Careers bulletin. You can also follow @UoNCareers and @UoNBioscicareers on twitter.

If you have any questions or if you would like to find out more about The Careers and Employability Service, please do visit one of the careers offices:

- **Sutton Bonington Campus** – Student Services Centre, The Barn, Sutton Bonington Campus
- **Science Faculty team** – B08, Pope Building, University Park

28 Health, Safety & Security

- The research buildings are open to students from 08:30am until 18:00pm, Monday to Friday, except public holidays and University holidays. If for any reason you have to be in the building outside if these times, you must be supervised by an academic member of staff.
- There are lifts available in all teaching buildings for use by disabled students. The other use of the lifts is for movement of goods, and should not be used for other purposes.
- The School has its own Safety Handbook which is available on the web at http://goo.gl/UASVap

Fire

- Fire alarms in the teaching buildings are tested at a regular time (eg Wednesday at 10 am in the Main Building). In the event of fire in the building the alarm will sound continuously. In the event of this the lecturer in charge of your class will organise evacuation of the building to the relevant assembly point. Fire exits are clearly sign-posted. Re-entry into the building after a fire alarm is given by the Fire Monitor.

Safety

- Safety in the building, especially in the Laboratories is paramount. See further reference to this matter under 'Practical Classes'
- Practical classes are continuously supervised by an academic member of staff with the support of demonstrators and occasionally technicians. You should not enter a laboratory until a member of staff arrives.
- Suitable protective clothing must be worn for laboratory classes (see 'Practical Work').
- Defined procedures must be followed for the disposal of certain types of laboratory waste, such as syringes and syringe needles, broken glass, organic solvents and microbial cultures. Instruction on the correct disposal of these and other items will be given in practical classes.
- Safety in Fieldwork. Field Course safety information and the Code of Practice for students can be found at: http://goo.gl/IBS6EF

Accidents & First Aid

- For minor injuries, first aid boxes are available in all laboratories and certain offices. In such situations it is likely you can deal with such injury yourself.
- Where an injury is more serious a qualified 'First Aider' should be called. Names of First Aiders are listed on the School's web pages.

- If a 'First Aider' is not available or if further treatment is required, you will be taken to the Cripps Health Centre or A&E at Queens Medical Centre in extreme situations.
- All accidents, whatever their severity, must be reported on an accident report form available from the member of staff taking the class at the time of the accident and will supervise completion of the form.

Food & Drinks

- On no account should food and/or drink be taken into a laboratory, lecture theatre or computing rooms.

29 Modules

Year 1 MODULES

AA1017 The Anthropology of Human Ecology

Module Convenor: Dr HA Forbes

School: Life Sciences, University Park

Module Details: level 1, Spring, 10 credits

Expected Number of Students taking module – 100

Target Students: Archaeology Honours students, Humanities Honours students, Biosciences Honours students, students from other Schools across the university seeking subsidiary modules, and Exchange students. This module has been identified as being particularly suitable for first year students.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The module investigates the social/cultural anthropological (and related disciplines) literature relevant to issues in Human Ecology. Following an introduction to the most basic principles of social/cultural anthropology and biological ecology, the module examines the ways in which traditional societies around the world relate to their environments. The module will concentrate particularly on factors of socio-political organisation such as kinship to illustrate the way in which social/cultural anthropologists study the interrelations of human groups and the very diverse environments world-wide on which they depend. This will be achieved by a series of case studies which may include:
Traditional techniques of slash and burn cultivation;
Intensification of agriculture in traditional societies;
The environmental effects of herding.

Assessment:
2 hour examination (100%)

Aims: The module introduces students to the anthropological literature relevant to issues in Human Ecology, including the most basic principles of social/cultural anthropology and biological ecology. It concentrates on how traditional societies relate to their environments. The module will concentrate particularly on factors of socio-political organisation, such as kinship, to illustrate the way in which social/cultural anthropologists study the interrelations of human groups and the very diverse environments world-wide on which they depend. This will be achieved by a series of case studies.

Learning Outcomes: A student who completes this programme successfully should have an elementary knowledge of a body of anthropological theory and data related to the ways in which non-western peoples relate to their environments. Students should be able to understand some simple scientific concepts relating to ecology, especially concepts of energy flow and trophic levels, and how they relate to the understanding of food-getting systems world-wide.

C111E1 Global Environmental Processes

Module Convenor: Dr Liz Bailey-EHB Liz.Bailey@nottingham.ac.uk

Module Details: A 20 credit Autumn Semester Module

Pre-requisite(s): Normal entry requirements for School of Biosciences

Expected Number of Students Taking Module: 70

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Availability to Exchange Students

Summary of Content: The unifying theme of this module is biogeochemical cycling - the production, distribution and cycling of materials on the Earth and their availability to, and use by, biological organisms. The introduction covers the history of the universe, from the big bang to the evolution of the Earth's surface environment, via formation of galaxies, stars, elements and the solar system. Then we describe the major global systems and their circulations as they are today - solids (plate tectonics, formation and erosion of crustal rocks), liquids (oceans, temperature and salinity gradients) and gases (atmosphere, weather and climate). In the final section we examine the major materials - including carbon, nitrogen, sulphur, oxygen and metals - and their budgets and cycles; and the interactions between biological and physical/chemical processes on a global scale.

Assessment:
Exam 100% - One 2 hour computer based examination paper.

Aims: To give students a general understanding of the physical, chemical and biological development of the Earth since the start of the Universe, and of the cyclical movement of the major materials such as carbon and nitrogen between biological and non-biological forms.

Learning Outcomes:
Ability to describe the origin and formation of the chemical elements, solar system, solid Earth, atmosphere and oceans.
An understanding of the structure and circulation of the solid Earth, its oceans and atmosphere.
Understanding of the chemical cycles of key chemical elements.
An understanding of the origin of life and how life survives on Earth.

Recommended Reading: Earth System Science. M.C. Jacobson, R.J. Charlson, H.Rodhe, and G.H Oreans. Academic Press 2000

C112P1 Plant Science

Module Convener: Dr Kevin Pyke Kevin.Pyke@nottingham.ac.uk

Module Details: Level 1 Spring Semester 10 credits.

Expected Number of Students Taking Module: 150

Target Students: Primarily available for students taking a degree in Biology, Biotechnology Environmental Science or Environmental Biology. Biotechnology and Exchange Students

Pre-requisite modules or other requirements: A level in Biology and Chemistry preferred

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Lecture Programme: Lectures will cover a variety of topics on modern plant science including plant morphology, photosynthesis and water movement, flowering and seed development biology, plant pathology, plant genetic transformation and the central role of the model organism *Arabidopsis thaliana* in plant science research. The module also has three practical sessions relating to the lecture material.

Example:

Week	SUBJECT	LECTURER
1	Plant Evolution and Plant Structure	KP
2	Photosynthesis	KP/RF
3	Flowering	ZW
4	Seed Development and Fruit ripening	KP
5	Water relations of plants	KP
6	Plants and Nutrients	MB
7	Plant Pathology	Matt D
8	Arabidopsis and Plant Tissue culture	RS/MD
9	Practical 1	ZW/PC/KP/NG
10	Practical 2	ZW/PC/KP/NG
11	Practical 3	ZW/PC/KP/NG

Staff: KP – Kevin Pyke; RF – Rupert Fray; ZW – Zoe Wilson; MB – Martin Broadley; Matt D – Matt Dickinson; PC – Peter Crittenden; RS – Ranjan Swarup

Assessment:

Exam 1 75% 1 hour 30 mins examination

Coursework 1 25% Coursework essay - 1000 words

Module Amendments introduced this session: Some changes to teaching personnel.

Module Aims: To provide an introduction to the biology and importance of plants. Lectures will focus on plant form and function, highlighting the ways that genetics and studies on the model plant, *Arabidopsis,* have added to our understanding. Emphasis will also be placed on the ways plants adapt to their surroundings and the potential for use of biotechnology in plant improvement.

Learning outcomes: On successful completion of the module, students will be able to:

1. Describe the process of plant evolution and place the Angiosperms in the context of different types of plants.
2. Discuss the cellular structure of plants, in particular seeds, leaves, flowers and roots and demonstrate an understanding of how these multicellular tissues are constructed.
3. Appreciate the importance of model plants such as Arabidopsis in the development of modern plant biology and demonstrate knowledge of how this plant's attributes have been exploited.
4. Recognise the importance of plant nutrition and the interaction with pathogens are crucial to plant growth and production
5. Develop professional skills in scientific information retrieval and to work safely in a laboratory situation.

Recommended reading:
Main Text:
Campbell NA, Reece JB and Mitchell LG (2011) Biology 9th International Edition

Secondary texts:
Raven Biology of Plants, Evert RF and Eichorn SE (2012)

All course material including PowerPoint lectures will be available on the web.

Lecturers on this course are members of the Plant and Crop Sciences Division, School of Biosciences, Sutton Bonington.
(www.nottingham.ac.uk/biosciences/plantcrop/index.html)

C11BE1 Dissertation in Environmental Science

Module Convenor and Lecturers: Dr Barry Lomax Barry.Lomax@nottingham.ac.uk
And Environmental Sciences tutors

Module Details: Level 1 Autumn and Spring – Full year, 20 credits

Note: Module **D212E4** is compulsory for Environmental Science undergraduates and is spread across the autumn and spring semester of year one.

Expected Number of Students Taking Module: 60

Target Students: Available to Environmental Science students, and Environmental Biology students.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This module is compulsory for Environmental Science and Biology undergraduates and is spread across the autumn and spring semester of year one. The module will be taught using a mixture of, lectures, lab and computer practical sessions alongside tutorials. Students are expected to attend three academic tutorials each semester. The module is structured around the production of a scientific paper. Students will cover scientific writing, data analysis, data presentation and referencing skills. There is a mixture of formative and summative assessment spread over semester I and II There are 3summative exercises within the module: 1) A lab report 20% Autumn semester 2) A formal report 50% Spring semester 3) Rogo Exam 30% Spring semester

Coursework : 1 lab report (20%) Autumn Semester and 1 formal report (50%) Spring Semester

Assessment: 30% Rogo exam, 70% coursework

Aims: This module will enable you to: • Use the library and other sources to retrieve information. • Read, understand and synthesise primary literature. • Develop your written presentation skills. Present and analyses data appropriately. Present and analyses data effectively • Manage and organise your time.

Learning Outcomes: On successful completion of this module, students will be able to:
Use the library services effectively to search for relevant literature.
Reference sources in an appropriate style(s).
Write and construct scientific documents (e.g. papers, reports) using appropriate styles, conventions, and terminology.
Identify an appropriate approaches for solving a quantitative problem through background and collaborative research.
Analyse and display scientific data appropriately.

C11EEB Evolution, Ecology and Behaviour

Module Convenor: Dr Kate Durrant

School: Life Sciences, University Park

Module Details: Level 1, Full Year, 20 credits

Expected Number of Students taking module - 60

Target Students – Students studying Biology and Zoology

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This module provides an introduction to the fundamentals of evolution, ecology and behaviour. Evolutionary processes are explored from a variety of approaches, from the fossil record, through adaptation, speciation and the study of phylogenetics and how it shapes the tree of life, right up to the cutting edge of genomic evolution. Modern ecology has never been a more important subject than now, a result of our major environmental problems. In this module ecological topics are explored by examining ecosystem processes, competition, predation, pathogens, parasites and disease, life histories, resources, niches, demographic processes, and sustainability. Understanding animal behaviour in response to their ecosystem begins with asking rigorous questions about foraging, signalling, sexual selection, parental care, altruism and also allows us to understand human behaviour in an evolutionary context.

Assessment Details:

Exam 1	15%	January – 1 hour multiple choice examination
Coursework 1	50%	Assessment of practical work - approx 1000 words
Exam 2	35%	May/June – 2 hours multiple choice examination

Aims: A student who completes this module will have an understanding of: - The fundamental processes of evolution - The history and diversity of life on Earth and how it is structured into ecosystems - Interactions between biotic and abiotic environmental factors - How living organisms adapt to their environment - How animals interact with their environment behaviourally - How evolutionary and ecological processes lead to genetic change and speciation - Current issues in areas of conservation, epidemiology and climate change

Learning Outcomes: A student who completes this module will be expected to be able: A1. to describe the evolution, genetics, behaviour and ecology of living organisms A2. to identify the relationship between evolution, ecology and behaviour and other biological disciplines and their relevance to humanity in the face of global challenges A3. to understand and use appropriate terminology to describe evolutionary, ecological and behavioural concepts A student who completes this module will have the ability: B2. to undertake appropriate experimental design and statistical analysis B3. to work safely in the field and laboratory, using appropriate equipment and instruments and assess related safety issues in order to make and record accurate observations and measurements B4. to acquire information systematically, process it effectively, and draw appropriate conclusions B5. to demonstrate numeracy and written skills in the evaluation of the results from practical work B6. to develop effective ways of working including productive team work, scheduling of tasks and

time management to meet deadlines B7. to demonstrate computing skills in the handling of scientific data and the use of on-line learning tools

C11LOE Life on Earth

Module Convenor: Dr Tom Hartman

School: Life Sciences, University Park

Module Details: Level 1, Full Year, 20 credits

Expected Number of Students taking module - 295

Target Students – Zoology, Biology, Biochemistry, Genetics, Environmental Biology.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The Life on Earth module will introduce the students to the vast range of living (and many extinct) species to be found on Earth. The various domains of life will be explored with due attention to the two prokaryote groups, the archea and eubacteria and then detailed views of the eukaryotes. Issues of how they arose and how the process of endysymbiosis added much more complexity will be examined. Questions about the processes that drove the evolution of complexity and multicellularity, the development of mitosis, meiosis and the production of asymmetrical gametes will be considered. Within the context of the most recent phylogenetic trees the distribution of phyla will be examined in detail with the most complex groups, fungi, animalia and plantae being targeted for special consideration. The course will emphasise our current understanding of biodiversity and how a simple morphological-based taxonomy has been shaken up by current molecular techniques. The module concentrates on the unity and diversity of life set in an evolutionary context and how the genotype gives rise to both phenotype and behaviour.

Assessment:

Exam 1	15%	January – 1 hour multiple choice examination
Coursework 1	50%	Lecture/practical related coursework - 5 x1000 word written reports/practical based submissions
Exam 2	35%	May/June – 2 hours multiple choice examination

Aims: A student who completes this module will have an understanding of: - cells, the basic unit of life - ancestral prokaryotes and a life without oxygen - evolution and diversity of Archaea and Bacteria - photoautotrophs and their impact on the evolution of life - how eukaryotic cells incorporated prokaryotes via endosymbiosis - the diversity of Protists - Beneficial and detrimental effects of fungi - multicellularity and the evolution and diversity of Fungi, Plants and Animals - genomic relationships and phylogeny - structure-function relationships in organisms and their relevance in the context of evolution - effects of global climate changes on the evolution of organisms - basic coverage of the interaction of organisms in the context of their evolution

Learning Outcomes: At the end of the module, students shall be able to A 1. describe the range of organisms on this planet and how they are related (historic and current views) A 2. relate organismal biology to other aspects of the natural science A 3. to identify the relationship between biodiversity and other biological disciplines and their relevance to humanity in the face of global challenges A 4. know and apply the terminology, as well as the nomenclature and classification of extant and extinct organisms A 5. describe and relate the structure and function of organisms A 6. investigate the morphology of organisms A 7. explain key features of the genetics and genome evolution A student who completes this module will have the ability to: B 1. to work safely in the laboratory, using appropriate equipment and instruments and assess related safety issues in order to make and record accurate observations and measurements B 2. to acquire information systematically, process it effectively, and draw appropriate conclusions B 3. to demonstrate numeracy and written skills

in the evaluation of the results from practical work B 4. to identify and use both compound and stereo microscopes and be capable of recording measurements of microscopic organisms

C51201 Micro-Organisms and Disease

Module Convenor: Dr A Cockayne

School: Life Sciences, University Park

Module Details: level 1, Spring, 10 credits

Expected Number of Students taking module - 25

Target Students: Those studying Microbiology who wish to specifically increase their knowledge of infectious diseases. Students in other areas of Life Sciences where human infectious diseases, pathogenic microorganisms or their products may have an impact.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: Students will be introduced to human infections caused by the main groups of bacterial and fungal pathogens and the mechanisms of disease causation. The immune system and its roles in prevention and response to infection and the theory and practical application of vaccination will be described. Laboratory diagnosis of infections and methods for antibiotic sensitivity will be reviewed. A short practical course will introduce students to some of the important laboratory methods used to isolate and identify medically important bacteria and determine their sensitivities to antibiotics.

Assessment: 2 hour examination (100%) Written Assessment (Essay style) TWO Sections: Section B: answer FIVE questions (all questions in section B). Section A: Answer FOUR questions from a choice of six questions.

Aims: To introduce students to a range of important human pathogens, their interactions with the immune system, mechanisms of disease causation and the laboratory procedures involved in diagnosis and treatment of infections.

Learning Outcomes: At the end of this module you will be able to: • Describe the characteristics of the main groups of bacterial and fungal pathogens of humans, the diseases they cause and the mechanisms involved in disease causation. • Describe the components and functions of the immune system and how it interacts with pathogenic and non-pathogenic microorganisms. • Outline the principles involved in vaccination and the types of vaccine available for prevention of infectious disease. • Describe the practical diagnostic procedures used in isolation of pathogens from different types of clinical specimen, their identification and the methods used for antibiotic sensitivity testing. • Attain practical experience of basic laboratory methods used in handling, identifying and antibiotic sensitivity testing of medically important bacteria.

D212A1 Grassland Management

Module Convener: Dr Matthew Bell Matthew.Bell@nottingham.ac.uk

Lecturers: Dr Stephen Ramsden, Prof Paul Wilson.

Module Details: Level 1 Spring Semester, 10 credits.

Expected Number of Students Taking Module: 40

Target Students: Students registered on BSc Agriculture, Agricultural and Crop Science, Plant Science, Animal Science, Biotechnology, Environmental Biology degrees and Exchange students.

Summary of Content: This module is delivered through e-learning, supported by tutorials and farm visits and covers the morphology and physiology of forage grass species, identification of grass species, grassland systems in the UK and worldwide and conservation of grass (hay/silage). The module will consider grassland management within mixed farming systems and specific requirements for environmental stewardship schemes.

Week	Subject	Lecturer
1	Introduction to the module and course work	AP
2	Student centred learning	
3	Student centred learning	
4	Grass physiology practical	AP
5	Student centred learning	
6	Pasture budget tutorials	SJR
7	Student centred learning	
8	Student centred learning	
9	Student centred learning	
10	Student centred learning	
11	Farm visit	AP

Timetable: Typically two one-hour timetabled sessions per week: twenty-three lectures, regular tutorials/examples classes, forty hours student led studies and revision. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Coursework: On-line test on grass morphology; written report on farm visit

Assessment:

Exam 1	50% 1 hour exam
Coursework 1	20% Online test
Coursework 2	30% Farm visit report. 1500 words.

Aims: To provide students with an appreciation of the different grassland management systems employed throughout the world.
- To provide students with an understanding of grass morphology and physiology.
- To develop skills in the use of keys to identify plant species.
- To encourage students to develop self-study skills early in their University careers.

Learning outcomes: On successful completion of the module, students will be able to:

- Identify the key structures of a grass plant.
- Describe the mechanisms of grass growth, production and utilisation and how these are influenced by management practices.
- Discuss the latest developments in grassland management and the policy issues associated with them.
- Calculate a pasture budget

Recommended Reading: Finch, HJS, Samuel, AM and Lane, GPF (2002) *Lockhart and Wiseman's crop husbandry; including grassland*. (8th edition). Woodhead, Cambridge. Hopkins, A (2000) Grass: its production and utilization. (3rd edition). Blackwell Science, Oxford. Frame, J and Laidlaw, S (2011) Improved grassland management. Crowwood Press.

D212A2 Contemporary Agricultural Systems

Module Convenor: Dr Matthew Bell Matthew.Bell@nottingham.ac.uk

Lecturer: Prof Paul Wilson (PW); Dr Stephen Ramsden (SR); Dr Michael Davies (MD); Keely Harris-Adams (KHA); Dr Scott Young (SY), Dr Helen West (HW)

Module Details: A level 1 module taught in the Spring Semester at Sutton Bonington. The module consists of an overview lecture followed by farm visits and student centred learning based on four farm research reports. 10 credits

Expected Number of Students Taking Module: 60

Target Students: For students studying Agriculture and related subject

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The module provides an overview of practical agricultural systems within commercial UK farm contexts. Fundamental concepts of agricultural systems and techniques are introduced via a series of on-farm visits and explanations, with these concepts being further developed by student centred learning, placing the information gained from the visits in the context of contemporary markets, policies and research findings.

Lecture Programme:
Week 1: Introduction: Farm Business Systems - core concepts
Week 2: Business
Week 3: Dairy
Week 4: Waste and Bioenergy
Week 5: Soils
Week 8: Fruit and Vegetables
Sheep 9: Sheep
Week 11: Agri-environmental interactions

Non Lecture Programme:
Please note that the order of the programme may change. Topics may vary depending on the issues affecting the agricultural industry in any one year.

Week 3: Dairy

Week 4: Waste and Bioenergy
Week 5: Soils
Week 6: Arable Production
Week 7: Labour and Machinery
Week 8: Week 9: Sheep
Week 10: Mixed System visit
Week 11: Agri-environmental interactions

Coursework: Coursework will count for 100% of the overall mark for this Module and consists of four 'Farm Research Reports' (maximum 1000 words). The reports will follow, although not necessarily be restricted to, four of the farm visits. The reports will test students' ability to place the information gained from the visits in the context of contemporary markets, policies and research findings.

Assessment:

Coursework 1	50	Farm System Report: Calculations, production of tables and 1000 words text
Coursework 2	50	Farm System Report: Calculations, production of tables and 1000 words text

Aims: The module aims to provide an overview of practical agricultural systems within commercial UK farm contexts. A range of fundamental concepts of agricultural systems and techniques are introduced via a series of on-farm visits and explanations. The topics of the visit may vary dependent upon the issues affecting the agricultural industry in any one year, but example topics covered include the following: dairy production, arable production, soils, agri-environment interactions, labour and machinery management, farm business systems, water and waste management, mixed farming systems. Students will further develop the concepts introduced via directed student centred learning, including integration of current research findings, leading to the production of four assessed reports.

Learning outcomes: On successful completion of the module, students will be able to:
1) Demonstrate and understanding of contemporary issues facing agriculture within the context of farm systems, enterprises and resource implications. 2) Use appropriate terminology to communicate issues and evidence-base proposals to agricultural and associated professionals3) Analyse information from a range of sources and apply this information to an agricultural systems context.
Intellectual Skills: 1) Evaluate the importance of individual aspects of agricultural practice with the context of an individual enterprise or activity and across the farm as a business system. 2) Develop approaches to integrating introductory material across a range of subjects 3) Assess the motivations and drivers for decisions made within a contemporary agricultural context.
Practical/Professional Skills: 1) Ability to interact and engage with professionals and practitioners in the agricultural industry 2) Understanding of the terminology used within different aspects of agricultural practice. 3) Place knowledge gained from research into a practical application and context. Transferable/Key Skills: 1) Appraise the relevance of key information to a range of familiar and unfamiliar contexts 2) Present information from a wide range of sources in a professional manner 3) Generate the confidence to engage with professionals in the industry in order to develop one's own understanding of a particular subject 4) Develop a skill set of terminology and practical knowledge that will be essential for a future career in agriculture and agricultural professional practice. 5) To listen to people 6) To evaluate the relevance of research results to contemporary agriculture.

Recommended Reading: Nix, J. (2015). Farm Management Pocketbook 2016, The Andersons Centre. Library location: S561.N4. Soffe, R.J. (2003). Primrose McConnell's The Agricultural Notebook, Twentieth Edition, Oxford: Blackwell Science.

D212E4 Environmental Science and Society

Module Convenor: Dr Ruth Blunt ruth.blunt@nottingham.ac.uk

Module Details: level 1, Full Year, 20 credits

Expected Number of Students taking module - 60

Target Students: Environmental Science Undergraduate Students.

Further Activity Detail: Including Lectures, Group Activity Sessions, Self-Directed Learning, Workshops, Group Presentation Session.

Summary of Content: This module introduces students to the role and limitations of environmental science within the context practical environmental decision making. The themes covered are illustrated through a series of environmental case studies (e.g. genetic engineering in agriculture, climate change, wild species conservation, fishery management, sea dumping, use of models, radiation protection).

Timetable: Typically two one-hour timetabled sessions per week twenty-three lectures, regular tutorials/examples classes, forty hours student led studies and revision. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Assessment:
1.5 hour online Rogo examination (50%)
Written assignment (1000 words) (25%)
Group poster presentation (25%)

Aims: To introduce students to the role and limitations of environmental science within the context practical environmental decision making. At the end of this module students should have a basic understanding of: (1) general scientific methods (2) the limits and assumptions of science and (3) **t**he social context of science based decision making.

Learning Outcomes: On successful completion of this module, students will be able to:

- Discuss the role, limitations and assumptions of science within the context of environmental decision making
- Discuss the social context and ethical considerations of environmental decision making

YEAR 2 MODULES

C123E3 Soil Science

Module Convener: Dr S Young Scott.Young@nottingham.ac.uk

Lecturers: Dr Helen West (HW), Prof Sacha Mooney (SM).

Module Details: Level 2, Autumn Semester, 10 credits.

Pre-requisites: No pre-requisites.

This is an introductory course, which is a pre-requisite for (C124E0) Soil and Water Science

Expected Number of Students Taking Module: 90

Target Students: (F900) BSc Environmental Science; (F750) MSci in Environmental Science; (C150) BSc Environmental Biology; (D400) Agriculture; (DF47) BSc Agriculture and Environmental Science; (D409) Agriculture and Crop Science and Exchange Students.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This is an introductory course which provides a basic understanding of the nature and properties of soil and the application of soil chemistry, biology and physics to land management and environmental science. Broadly, the topics covered include: soil formation; clay mineralogy; soil organic matter (microbiology and chemistry); soil texture and structure; characteristic soil reactions (acidity, redox); the major and minor plant nutrients (chemistry and microbiology); soil fauna and flora; water relations (irrigation and drainage).

Lecture Programme:
Week Topic

1	Introduction to course (SY); soil clays: mineralogy and function (SY)
2	Soil organic matter (SY); Major soil nutrients – nitrogen (SY)
3	Major soil nutrients – phosphate and potassium (SY); Soil acidity (SY)
4	Redox reactions in soils (SY); Soil trace elements (SY)
5	Introduction to life in the soil (HW); Soil biological processes I (HW).
6	Soil biological processes II (HW); Soil bioremediation and reclamation (HW)
7	Soil texture (SJM); Soil structure (SJM).
8	Soil water content (SJM); Soil water potential (SJM).
9	Soil aeration (SJM); Soil water movement (SJM)
10	Soil erosion (SM); soil compaction (SJM); Course appraisal (SY)
11	Reading week.

Assessment:
Exam 1 100% 2-hour multiple choice exam with 100 short questions requiring single choice from 4 options

Aims: To provide an understanding of the physical, chemical and biological properties of soils and terrestrial processes. To provide training in the practical interpretation of soil information for land management purposes. At the end of the module, the students should (i) possess quantitative knowledge of the magnitude of common soil parameters; (ii) have a clear understanding of the inter-relationship of soil processes; (iii) be able to offer pragmatic advice on soil management to environmental and agronomic managers.

Learning Outcomes: On successful completion of this module, students will be able to:

- Discuss the composition and origins of soil geo-colloids and humus and their roles in soil as a medium for plant growth.
- Explain the processes governing nutrient transformations and dynamics in soils.
- Describe the role of soil texture and structure in governing soil physical processes.
- Demonstrate understanding of soil water relations and water movement in soils.
- Outline the nature of soil flora and fauna and their dependency on soil conditions.
- Discuss the functions of soil biota in soil as a medium for plant growth.

Recommended Reading: Rowell, D.L. 1994. *Soil Science; Methods and Applications*. Longman, UK. Ashman, M.R. and Puri, G. 2002. Essential Soil Science. Blackwell Publishing, UK. Note: All lectures are provided as PowerPoint files within the Blackboard VLE.

C123E7 Climate Change Science

Module Convenor: Dr S Sjogersten Sofie.Sjogersten@nottingham.ac.uk

Module Details: Level 2 Autumn Semester, 10 credits

Pre-requisites: BSc Environmental Science Year 1 or equivalent

Co-requisites: None

Target Students: The module is most appropriate for BSc Environmental Science, Environmental Biology, Biology and Geography students but is not restricted to them.

Availability to Exchange Students: No

Summary of Content: The module presents a broad overview of the science behind climate change and its effects. These topics are: historical climate change; the principles of climate forcing; the role of modelling; responses of aquatic and terrestrial ecosystems, including impacts on humans; the political environment; and options for climate stabilization.

Timetable: The teaching timetable will be finalised during the Autumn Semester, and will be based on 11 x 1/2 day sessions. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Teaching Staff: Prof Neil Crout, Dr Sofie Sjogersten

Assessment Details:

Assessment Type	Percentage of module	Requirements	Length
Exam 1	100	Exam	2 hour

Aims: To give a general understanding of the science issues that underpin climate change. • To show the importance of historical understanding in interpreting the present and predicting the future. • To give an understanding of the energy flows that are causing climate change, and insights into the way that computer models can be used to relate complex parameter sets. • To review the impacts of climate change for plants, animals and people, both on land and in the oceans. • To show how a range of options exists for reducing and stabilising climate change.

Learning Outcomes:

- The students will have detailed knowledge of processes controlling the global climate.
- The students will be able to understand sources of and interpretation of records of past climates.
- The students will be able to discuss how climate change impacts on the Earth system over different time scales.
- The students will be able to synthesis and present information from the published literature.

C12321 Animal Behaviour

Module Convenor: Dr K Durrant

School: Life Sciences, University Park

Module Details: Level 2 Autumn Semester, 10 credits

Pre-requisites: None

Target Students: The course is designed for Biology and Zoology students

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This module provides a comprehensive introduction to the study of animal behaviour, from the physiological and genetic bases of behaviour to its development and adaptive significance in the natural environment. Using examples from across the animal kingdom, it emphasizes how predictive modelling, experimental and observational approaches integrate to explain how and why animals behave as they do.

Further Activity Detail: Half a day a week. Learning will be based on lectures, group discussions and ICT tutorials

Assessment Details:

Exam 1	100%	One 2 hour paper. MCQ (50%) and written essay (50%) examination

Aims: This module provides a comprehensive introduction to the study of animal behaviour, from the physiological and genetic bases of behaviour to its development and adaptive significance in the natural environment. Using examples from across the animal kingdom, it emphasizes how predictive modelling, experimental and observational approaches integrate to explain how and why animals behave as they do.

Learning Outcomes: Knowledge and understanding of A1. the relationship between the life and environmental sciences and other disciplines and forms of knowledge (t+l+a) A2.current trends and developments with the life and environmental sciences (t+l+a) A3. appropriate terminology, nomenclature and classification (t+l+a) A4. genetics (t+l+a) A5. organism behaviour (t+l+a) A7. interaction of organisms and their environment (t+l+a) Intellectual Skills - the ability to B1. critically analyse and interpret published information and data (t+l+a) B2. think independently while giving due weight to the arguments of others (t+l+a) B3. understand complex ideas and relate them to specific problems or questions (t+l+a) B4. acquire substantial quantities of information systematically, process it effectively, and draw appropriate conclusions (t+l+a) Professional Skills - the ability to C2. articulate knowledge and understanding of scientific concepts (t+l+a) Transferable Skills - the ability to D2. communicate effectively in writing (t+l+a) D4. organise and manage working time, schedule tasks, and meet deadlines (l) D5. use and access information and communication technology (t+l+a) D6. reflect upon and assess your own progress, strengths and weaknesses (l)

C12338 Ecology

Module Convenor: Prof FS Gilbert

School: Life Sciences, University Park

Module Details: Level 2 Autumn Semester, 10 credits

Pre-requisites: None

Expected Number of Students Taking Module: 120

Target Students: BSc and MSci students studying biological subjects, but not restricted to them.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: Modern ecology has never been a more important subject than now, a result of our major environmental problems. This module introduces the study of the ecology of populations and communities from an evolutionary point of view, and considers critically the extent of our understanding of ecological ideas.

Assessment Details:
Exam 1 100% 2 hour exam

Aims: To introduce modern ideas in ecology, from individuals to populations and communities, from an evolutionary perspective. Students will acquire a detailed knowledge of the theories and evidence underlying current understanding in ecology. At the end of this module students should: (1) have a clear understanding of the theories behind ecological concepts and ideas; (2) appreciate the evidence that is brought to bear upon the testing of these theories; (3) appreciate why such ideas have relevance in understanding human behaviour and ecology, and the current ecological crisis.

Learning Outcomes: A1. the relationship between the life and environmental sciences and other disciplines and forms of knowledge (t,l,a) A2. current trends and developments with the life and environmental sciences (t,l,a) A3. appropriate terminology, nomenclature and classification (t,l,a) A7. interaction of organisms and their environment (t,l,a) B1. critically analyse and interpret published information and data (t,l,a) B2. think independently while giving due weight to the arguments of others (t,l,a) B3. understand complex ideas and relate them to specific problems or questions (t,l,a) C2. articulate knowledge and understanding of scientific concepts (t,l,a) D2. communicate effectively in writing (a) D5. use and access information and communication technology (a)

C124E0 Soil and Water Science

Module Convenor: Professor Sacha Mooney Sacha.Mooney@nottingham.ac.uk

Lecturers: Dr Scott Young, Dr Liz Bailey

Module Details: Level 2 Spring Semester, 20 Credits

This module is capped at 60 - You will need permission from the module convener to take this module unless it is a core module for your course

Pre-requisites: C123E3 Soil Science, C111E1 Global Environmental Processes, C111E5 Environmental Geoscience

Target Students: BSc (Hons) Environmental Science and Environmental Biology - Availability to Exchange Students BUT Not applicable for year 1.

Summary of Content: An advanced study of the physical and chemical processes that govern the behaviour and interaction of soil and fresh water systems. The module includes the study of: 1) The Hydrologic Cycle, the mechanisms controlling the movement and storage of water, into, through and within soils including infiltration and runoff, sustainable management of soils. 2) The processes that govern the movement of solutes and colloidal material. 3) Surface and sub-surface waters – chemistry of precipitation, rivers and lakes including impact of biological organisms on lake chemistry, major and trace element geochemistry of surface and sub-surface waters, controls on their composition, recharge, weathering rates and solubility of aquifer rocks, water bearing properties of common rock types.

Timetable: Typically one four-hour timetabled session per week: twenty lectures, regular tutorials/examples classes, forty hours student led studies and revision. Two assessed practicals run in the afternoon of weeks 3 and 8. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Example Lecture Programme

2016 -17 Spring

Module Name	**Soil & Water Science**	**Module Code**	**C124E0**

Week	Date	Duration		Subject	Format	Rm No	Staff
		From	To				
1	TBC	09.00	13.00	The Hydrological Cycle	Lecture	Physics C04	SM&EB
2	TBC	09.00	13.00	Soil Water Potential	Lecture	Physics C04	SM
3	TBC	09.00	13.00	Soil Water Flow Processes*	Lecture	Physics C04	SM

4	TBC	09.00	13.00	Sustainable Soil Management	Lecture	Physics C04	SM
5	TBC	09.00	13.00	Geo-colloids & Salinity	Lecture	Physics C04	SY
6	TBC	09.00	13.00	Adsorption	Lecture	Physics C04	EB&SY
7	TBC	09.00	13.00	Reduction and Oxidation	Lecture	Physics C04	SY&EB
8	TBC	09.00	13.00	Solubility 1*	Lecture	Physics C04	EB&SY
9	TBC	09.00	13.00	Solubility 2	Lecture	Physics C04	SY&EB
10	TBC	09.00	13.00	Diffusion & Kinetics	Lecture	Physics C04	EB&SY
11	TBC	09.00	13.00	Assessment Review	Lecture	Physics C04	ALL

Further Activity Detail: Lecture 10 weeks X2 hours per week; Practical 2 weeks x4 hours. Minimum of 2 x 1 hr formal lectures followed by smaller group teaching such as tutorials, problem solving based group work, computer-aided learning sessions, field measurements and demonstrations. The practical sessions will be formal laboratory exercises that will form part of the coursework assessments.

Assessment:

Exam 1	70%	2 hrs (Rogo)
Coursework 1	30%	2 x 1000 word laboratory style reports

Aims: The aim of the module is to provide a sound understanding of important physical and chemical processes that take place within soils and fresh water systems. This includes provide a basis for the understanding of more applied aspects of the behaviour of these systems (e.g. plant-soil interactions, pollution and its remediation).

Learning outcomes: On successful completion of this module, students will develop:
1. Specific knowledge of the physical processes that govern the behaviour of soil and water systems including an understanding of the physical processes controlling water retention and flow through soils and the underlying geology.
2. Specific knowledge concerning the chemical processes that occur within soil and water systems including an understanding of the major physico-chemical processes that generate waters of different chemistries at or near the Earth's surface.
3. Quantitative knowledge on how to appropriately interpret physical and chemical data relating to soil and water systems.
4. Wider knowledge and understanding of the key principles concerning the sustainable management of soil and water systems.

Recommended Reading: Bohn, H., McNeal, B and O'Conner, G. 1985. Soil Chemistry. John Wiley & Sons, New York. Hillel, D. (1998) Environmental soil physics, Academic Press, California. Langmuir, D. 1997. Aqueous Environmental Geochemistry. Prentice Hall, New Jersey. Marshall, T.J., Holmes, J.W., & Rose, V. (1999). Soil Physics. Cambridge University Press, Cambridge.

C12458 Biological Photography and Imaging 1

Module Convenor: Mr David McMahon

School: Life Sciences, University Park

Module Details: Level 2 Spring Semester, 10 credits

Pre-requisites: Previous knowledge of photography is not essential

Co-requisites: None

Expected Number of Students Taking Module: 160

Target Students: (C100/C101) Biology; (C300/C301) Zoology; (F900) Environmental Science

Summary of Content: There is a limited number of places on this module. Students are reminded that enrolments which are not agreed by the Offering School in advance may be cancelled without notice.This is a techniques module, biological photography application being the core component. During the practical sessions students will demonstrate practical competence in the techniques of biological image production and manipulation, including the ability to generate biological images of the highest technical quality and scientific value. Students will gain an understanding of how biological imaging helps the professional biologist. Evaluate critically the scientific 'content' and 'value' of any biological image or series of images. Assess how different lighting conditions can modify the final image produced and so enhance the nature of the biological information being communicated.

Assessment Details:
Project 1 100%

Aims: To enable students to acquire skills and techniques in Biological Photography and Imaging, and apply this knowledge to the development of scientific visualisation of biological concepts. To emphasise the importance of the medium and communication of digital imagaing as a research tool for biologists. The module is practically based to encourage teamwork and communication skills to produce high quality biological imaging and application. We will provide training and sufficient resources to enable you (the student) to acquire the following skills: 1. Professional level transferable skills in the subject area of Biological Photography and Imaging. 2. To foster an atmosphere of creative learning through experience and discussion. 3. Enable students to use different lighting conditions in order to modify and enhance the photographic image in order to communicate the significance of the biological information required.

Learning Outcomes: Knowledge and understanding
A1. the relationship between the life and environmental sciences and other disciplines and forms of knowledge (t,l,p,a)
Intellectual skills - the ability to:
B1. critically analyse and interpret published information and data (l)
B2. think independently while giving due weight to the arguments of others (l,p,a)
B3. understand complex ideas and relate them to specific problems or questions (t,p,a)
B4. acquire substantial quantities of information systematically, process it effectively, and

draw appropriate conclusions (t,l,p,a)
B5. make and record accurate observations and measurements (l,p)

Practical skills - the ability to:
C3. write and construct scientific documents (e.g. papers, reports, posters etc) using appropriate styles, conventions, and terminology (t,l,p)
C4. work safely in the laboratory and the field and to assess related safety issues (t,l,p,a)
C6. undertake practical experimental work using appropriate equipment and instruments (t,l,p,a)

Transferable/key skills - the ability to:
D1. work productively with others (t,l,p,a)
D2. communicate effectively in writing (l,p,a)
D4. organise and manage your working time, schedule tasks, and meet deadlines (t,l,p,a)
D5. use and access information and communication technology (l,p)
D6. reflect upon and assess your own progress, strengths and weaknesses (l,p,a)

C12473 Natural Systems

Module Convenor: Dr MP Eichhorn

School: Life Sciences, University Park

Module Details: Level 2 Spring Semester, 10 credits

Pre-requisites: C12338 Ecology recommended. C12342 Biodiversity Field Course recommended

Expected Number of Students Taking Module: 80

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: We will consider the principles underlying the structure and higher organisation of natural systems. This encompasses diversity theory, community ecology, ecosystem functioning and biogeography. As this is a rapidly developing area, much of the material is recent and often controversial, and the content is updated every year to keep track of new findings. The module is intended to complement Ecology (C12338). Whereas Ecology takes a bottom-up approach, focussing on underlying processes in nature, this module adds a top-down perspective with the aim of understanding broad-scale patterns.

Assessment Details:
Exam 1 80% One two-hour essay-based examination 2 hours
Coursework 1 20% One data interpretation exercise during the semester.

Aims: We will consider the principles underlying the structure and higher organisation of natural systems. This encompasses diversity theory, community ecology, ecosystem functioning and biogeography. As this is a rapidly developing area, much of the material is recent and often controversial, and the content is updated every year to keep track of new findings. The module is intended to complement Ecology (C12338). Whereas Ecology takes a bottom-up approach, focussing on underlying processes in nature, this module adds a top-down perspective with the aim of understanding broad-scale patterns.

Learning Outcomes: A1. An understanding of how biological diversity links with other fields in biology and its broader implications A2. A current understanding of the organisation and diversity of nature. A3. The importance of ecosystem processes to human health and livelihoods A4. The methods by which organismal diversity is measured and classified A5. Evolutionary forces imposed on integrated communities of organisms A7. Complementary and adaptive evolution of organisms A8. Implications of the behaviour of organisms in a community context A9. The role of the environment in determining natural patterns and processes A10. The importance of biological diversity and its conservation to human society B1. Critically analyse and interpret data on diversity B2. Think independently and critically about current theories B3. Appreciate modern theoretical developments and relate them to applied conservation and natural resource management B4. Acquire substantial quantities of information systematically, process it effectively, and draw appropriate conclusions B5. Understand how to measure and record various forms of natural diversity C1. Carry out scientific research and evaluate and make use of literature material C2. Write and construct data analysis reports using appropriate styles, conventions, and terminology C4. Undertake appropriate experimental design and statistical analysis C6. Apply basic knowledge of

practical approaches and techniques D1. Communicate effectively in writing D3. Organise and manage their working time, schedule tasks, and meet deadlines D4. Use and access information and communication technology through learning websites D5. Reflect on and assess their own progress, strengths and weaknesses D6. manage and manipulate numerical data in a data handling exercise

C12477 Evolutionary Biology of Animals

Module Convenor: Dr SL Goodacre

School: Life Sciences

Module Details: Level 2 Spring Semester, 10 credits

Expected Number of Students Taking Module: 100

Target Students: Students from the School of Biology, Zoology, Genetics

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: Evolutionary thinking is overarching all disciplines in zoology and molecular genetics. The main objective of this module is to introduce the student to key evolutionary concepts. It aims to allow the student to place their scientific interests within the broader context of evolution and to provide valuable background information that will benefit future modules taken in subsequent academic years. We have chosen a few major areas in evolutionary biology to which each we are devoting one lecture each. The objective is to present key concepts for each of these rather than to be exhaustive. 1. History of evolutionary thinking 2. Genome evolution 3. Natural selection versus genetic drift 4. Adaptation, speciation and population structure 5. Population differentiation and phylogeography 6. Sexual selection 7. Domestication 8. Human evolution 9. Paleontology, macroevolution and extinction 10. Guest speaker and revision session.

Assessment Details:
Exam 1 100% Combination of multiple choice and essay

Aims: This module aims to provide a general introduction to key evolutionary concepts in different fields of animal biology including human.

Learning Outcomes: Knowledge and understanding: A1. By the end of each of the module, the students should have gained knowledge of the theoretical concepts behind each evolutionary field presented. A2. The student will be aware of the foundations of each subject with an appreciation of the direction of the current research in the field. A3. Introduction to the appropriate conventions and terminology of each field. Intellectual skills – the ability to B1. Understand evolutionary scientific concepts. Understand complex idea and related them to practical/illustrative examples. B2. Acquire substantial quantity of information systematically, to process them effectively in order to integrate them effectively across the broad field of evolution. B3. Critical thinking will be developed through encouragement of thinking independently while giving weight to the arguments of the different theories– concepts presented and drawing appropriated conclusions. B4 Scientific curiosity. Practical skills – the ability to: C1. Articulation of knowledge and understanding of scientific concepts. C2. Awareness of the importance of sounds observations and scientific data for theoretical development of concepts. C3 Critical reading of the scientific literature. Transferable/key skills – the ability to: D1. Use and access information and

communication technology. D2 Reflect an*d* assess our own progress, strength and weaknesses.

D223E2 Environmental Science Field Course

Module Convener: Dr Ruth Blunt Ruth.Blunt@nottingham.ac.uk

Lecturers: Professor Martin Broadley, Professor Sacha Mooney

Module Details: Level 2, Autumn, 10 credits

Module capped at 35 - You will need permission from the module convener to take this module unless it is a core module for your course (Environmental Biology)

Target Students: BSc Environmental Biology and Environmental Science students and other students in the Schools of Biosciences and Life Sciences.

Availability to Exchange Students Yes

Pre-requisites: If you are a student with a disability, and you have not already disclosed your disability to the module convenor, you should discuss any needs you may have with the module convenor at the point of registering for this module. The University will take all reasonable steps to ensure that any student with a disability is able to access this module.

Summary of Content: This residential field course module involves studies of various communities and ecosystems using a range of field techniques to investigate factors which determine the distribution and function of living organisms. Students are required to pay a contribution towards the cost of the field course. The residential component takes place in June after the end of the first year. The Field Course report is submitted in Semester 3.

Timetable: Detailed arrangements vary from year to year depending on factors such as tide conditions and personnel. The table shows the likely structure for 2016. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Lecture Programme: Introductory talks and wind-up sessions for each of the field activities are given by University of Nottingham and Slapton Ley staff assisting with particular activities.

Non-Lecture Programme: Four days of field work and laboratory analysis of samples.

	Morning	**Afternoon**	**Evening**
Sunday June		Arrive at Slapton Ley Field Centre	Introductory session: nature reserve, management, coastal erosion etc.
Monday June	Shingle Ridge: Introduction & Fieldwork	Shingle Ridge: Fieldwork	Shingle Ridge: Data analysis
Tuesday June	Soil Hydrology: Introduction & Fieldwork	Soil Hydrology: Fieldwork	Soil Hydrology: Data analysis
Wednesday June	River Sampling: Introduction & Fieldwork	River Sampling: Fieldwork	River Sampling: Data analysis
Thursday June	Depart		

Participating Staff:
Martin Broadley, School of Biosciences (Qualified First Aider)
Sacha Mooney, School of Biosciences (Qualified First Aider)

Ruth Blunt, School of Biosciences
Debbie Gregson, Field Studies Centre Ecologist (Qualified First Aider

Assessment Details:
Coursework 1: A field course report of 5000 words maximum, combining a report of all three field activities. A field notebook should be submitted at the end of the course. This is not assessed, but failure to submit a complete notebook will lead to a deduction of up to 10% of the module marks.

Aims: This five-day residential field course module, including travel, is based at Slapton Ley Field Centre in south Devon (http://www.field-studies council.org/centres/slapton/slaptonley.aspx). It is a Semester 3 module, although the fieldwork is carried out in June, immediately after the end of First Year. The module involves studies of various ecosystems using a range of field techniques to investigate factors determining the distribution and function of organisms. The residential component is supplemented by a report submitted during the autumn semester of Second Year. Students are required to contribute towards the cost of the field course.

Learning outcomes: On successful completion of this module, students will be able to:
- Describe how abiotic and biotic factors determine the distribution and function of living organisms in tropical environments.
- Explain how communities are affected by human activities.
- Design and conduct field-based experiments based on clearly formulated hypotheses, demonstrating good field practices through clear note taking.
- Analyse and present scientific data, clearly and concisely, in written, visual and oral presentation forms.

Recommended background reading: A list of recommended texts is provided during the course.

D223E3 Research and Professional Skills for Environmental Scientists 1

Module Convenor: Dr R Blunt Ruth.Blunt@nottingham.ac.uk

Module Details: Level 2 Autumn Semester, 20 credits

Prerequisites: Successful progression from qualifying Year of Environmental Science degree

Expected Number of Students taking module - 45

Target Students – Environmental Science Undergraduate Students and Exchange Students

Summary of Content: This module is designed to give students an opportunity to develop vital research and professional skills. Students will develop their group work, leadership, time management statistical and communication skills whilst working on a range of practical tasks. Throughout the course students will work on real word problems and projects and will have the opportunity to consider the different career paths available to a Environmental Sciences graduate.

Assessment Details:
Examination 40%; MCQ Rogo exam 1.5 hrs; Coursework 1: 60% Portfolio

Aims: To familiarise students with the research carried out within the environmental science group and the different approaches to research. To provide practical experience in experimental design, statistical analysis, data presentation and communication skills.

Learning Outcomes: 1. Demonstrate an understanding of the research process 2. Demonstrate the ability to use and interpret a range of statistical tests 3. Demonstrate a range of professional behaviours and competencies associated with an environmental scientist.

D223E4 Ecosystem Processes

Module Convenor: Dr Sofie Sjogersten Sophie.Sjogersten@nottingham.ac.uk

Lecturer: Dr Sofie Sjogersten Turner Sofie.Sjogersten@nottingham.ac.uk

Module Details: Level 2 Autumn Semester, 10 credits

Pre requisites: None

Co-requisites: None

Expected Number of Students Taking Module: 60

Restriction for Cap: Environmental science and related areas, especially those wishing to take artic ecology field course.

Target Students: Availability to Exchange Students.

Summary of Content: The course will focus on the processes that govern terrestrial ecosystem function. We will identify key ecosystem drivers and processes and explore how these have shaped the biosphere. Students will gain an understanding of the mechanisms that control changes in the physiochemical environment and their impact upon communities. Particular topics will include primary productivity, decomposition, herbivory, biodiversity and human impact on ecosystems. Classes comprise a mix of lectures, laboratory practicals, a computer practical, a seminar and fieldwork.

Timetable: Typically two one-hour timetabled sessions per week: twenty-three lectures, regular tutorials/examples classes, forty hours student led studies and revision. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Aims: To gain a broad knowledge of the major biomes. To identify key ecosystem drivers and processes and explore how these have shaped the biosphere

Learning Outcomes: On successful completion of this module, students will be able to:

- Discuss the key processes that govern ecosystem function
- Explain how humans can impact ecosystems
- Measure a number of key ecosystem processes, in the laboratory and field
- Simulate soil carbon stocks using simple mathematical models

Assessment:

Exam 1	75%	1 * 2hr Examination (Rogo)
Coursework 1	25%	Laboratory reports - 400 words

Lecture Programme: Lecture programme is provisional and more detailed information will be given to you in the first session.

Week	***Class***	***Topic***	***Staff***
1	Lecture	NPP	SS
2	Practical (lab)	Impact of N on chlorophyll content + start of litter decomposition experiment ***ASSESSED LAB REPORT***	SS/DH
3	Lecture	Biodiversity	SS
4	Practical (outdoor)	Plant and insect biodiversity	SS/DH
5	Lecture	Herbivory	SS
6	Practical (field)	Herbivory exclosures	DH
7	Lecture	Decomposition	SS
8	Lecture	Human impacts on ecosystems	RB
9	Practical (computer)	Soil C - Modelling exercises	SS
10	Seminar	TBC	SS
11	Practical (lab)	Completion of Litter decomposition experiment ***ASSESSED LAB REPORT***	SS/DH
12	Lecture	Oil palm case study	SS

D223P9 Applied Plant Physiology: from cell to crop

Module Convenors: Drs Erik Murchie (EM) Erik.Murchie@nottingham.ac.uk

Other teaching staff: Dr Kevin Pyke (KP), Dr Rupert Fray (RF), Dr Neil Graham (NG)

Module Details: Level 2 Autumn Semester, 20 Credit

Pre-requisites: D211F3: The Biosciences and Global Food security, C112P1: Plant Science or equivalent.

Expected Number of Students Taking Module: 70

Target Students: Students in the Schools of Biosciences and Life Sciences.

Availability to Exchange Students Yes

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This module provides a comprehensive understanding of plant physiology with an applied context from the molecular level to the field. There is an emphasis on the mechanisms that plants use to capture and utilise physical resources i.e. solar energy, water and nutrients. The module examines the physiological basis of resource capture and utilisation in growth and development, physical aspects of the plant environment incorporating key processes (photosynthesis, respiration, uptake and transpiration of water, the uptake and role of mineral nutrients). This physiological understanding will be applied in an agricultural context to consider major crop species in the UK and worldwide, and how cropping is affected by soil type. Limitations to resource capture by crops, and how growers overcome these, will be considered in relation to integrated crop management. The module also considers contemporary issues and future developments in agronomy and the role of the agronomist in successful crop management.

(Provisional timetable) All lectures unless stated otherwise

Week	*SUBJECT*	*LECTURER*
1	-Photosynthesis: organelle structure and function -Major crop species	KP DS
2	-Photosynthesis: how chloroplasts work -Practical: Major Crop Species	KP,RF DS
3	-Photosynthesis: diversity and ecology -Soils and Cropping Systems	KP,EM DS
4	-How crops capture and 'convert' solar energy to yield -Weed biology	EM DS
5	-Weed management - Practical: weed competition and nutrients	DS DS/NG
6	- Environmental physiology of plants and crops: temperature, photosynthesis, respiration and stress -Practical: photosynthesis	EM EM/RF
7	-How does water move through plants? -Practical: water and photosynthesis	EM EM
8	-Stomata: structure and function of a small but globally significant plant organ -Root traits for water and nutrient uptake	EM DS/TBC

9	-Water use efficiency of crops -Group work on conservation agriculture	EM DS
10	-Plant nutrients, uptake and functions	NG
	- Mixed species cropping	TBC
11	- Nutrient, transport, assimilation and use in crops -	NG DS/EM

Coursework: 40 %. A written report (1500 words) related to the practical sessions.

Assessment: Exam 1 60 %. Short questions and answers on module material using computers running Rogo software. This is timetabled and will take place in an IT lab.

Aims: The module is designed to introduce the key processes by which individual plants and plant communities capture and use physical resources i.e. light, water and nutrients, and provides an understanding of the physical and chemical processes and key biological processes involved. This is placed into an applied setting by considering agricultural examples and crop management strategies. By the end of the module, the student should understand not only the individual mechanisms, but also appreciate the importance of their integration into crop processes and the relevance of this to contemporary environmental and agricultural issues.

Learning outcomes: On successful completion of this module, students will be able to:

- Describe the physical resources available for plant growth and development
- Explain how soil type and climate affect crop choice
- Explain the physiological mechanisms by which plants capture physical resources and convert them to growth
- Discuss the abiotic and biotic limitations to plant and crop productivity by resource availability and use
- Analyse data accurately and critically and write a referenced scientific report.
- Devise integrated crop management strategies

D224E4 Computer Modelling in Science: Introduction (UP)

Module Convenor: Dr Dov Stekel Dov.Stekel@nottingham.ac.uk

Module Details: Level 2 Spring Semester, 20 credits

Prerequisites: Level 3 students who have already taken C135E9 will not be admitted to this module.

Co-requisites: None

Location: University Park Campus

Expected Number of Students Taking Module: 60

Target Students: All School of Biosciences students, Natural Sciences students and Ningbo 2+2 Environmental Sciences students (based in Geography).

Summary of Content: Modern biological and environmental science includes the study of complex systems and large data sets, including imaging data. This necessitates the use of computer models and analyses in order to understand these systems. This module contains an introduction to computer programming and modelling techniques that are used in the biological and environmental sciences. Specifically, it contains: (i) An introduction to computer programming and algorithms, using the Python programming language. (ii) An introduction the construction of mathematical models for biological and environmental systems using difference and differential equations, with a particular emphasis on population dynamics, and the use of computing to simulate, analyze these models and fit these models to data. Throughout the module, the focus will be on relevant examples and applications, e.g. environmental pollution, growth of microbial populations, disease epidemics, or computer manipulation of images of plants, animals or the natural environment. The module will be assessed by a patchwork assessment consisting of write-ups of assignments from during the semester.

Timetable: The first week of term is a two hour session, followed by 9 four hour sessions. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Lecture Programme: All teaching will be mixed mode (lecture/computer practical) in computer rooms. Lecture programme is provisional and more detailed information will be given to you in the first session.

1. Module introduction (Stekel)
2. Introduction to Python (French)
3. Programming in Python (French)
4. Python modules: NumPy and MatPlotLib (French)
5. Modelling: difference equations (Martin)
6. Modelling: simple differential equations (Stekel)
7. Modelling: differential equations and SciPy (Stekel)
8. Modelling: multi-dimensional systems (Stekel)
9. Modelling: steady state analysis (Stekel)
10. Model building and workshop (Martin)

Teaching Staff: Dr Sarah Martin (SM), Dr Dov Stekel (DJS), Dr Andrew French (APF)

On-line material: Supporting background material on computing and mathematical concepts (e.g. algorithms, calculus) will be posted on-line with on-line exercises to complete.

Assessment: Patchwork Assessment (100%) consisting of write-up of related assignments from the whole module.

Aims: The aim of this module is to introduce the use of computing programming and modelling in the biological and environmental sciences for model simulation and image processing.

Learning outcomes: A student who successfully completes this module should be able to: (i) Transform a series of instructions specified mathematically or textually into a pseudocode algorithm. (ii) Create or modify simple computer program code in order to carry out a set algorithmic task. (iii) Critically evaluate the use and results of suitable computer algorithms or programs in the context of relevant challenges in the biological or environmental sciences. (iv) Construct a simple mathematical model from a set of biological or environmental processes. (v) Simulate and analyse mathematical models using a computer and appropriate software and/or algorithms. (vii) Critically evaluate a mathematical model and its simulation results in the context of relevant challenges in the biological or environmental sciences.

Recommended Reading: A full reading list will be provided at the outset of the module.

D224E5 Research and Professional Skills for Environmental Scientists 2

Module Convenors: Dr Ruth Blunt Ruth.Blunt@nottingham.ac.uk and Dr S Sjogersten Sofie.Sjogersten@nottingham.ac.uk

Module Details: Level 2 Spring Semester, 20 credits

Prerequisites: None

Corequisites: None

Expected Number of Students taking module - 50

Target Students: Environmental Science undergraduate students

Summary of Content: During this module students will choose a topic for their final year research project. By the end of the module students will have identified a project supervisor undertaken a literature review in their chosen area and produced a project proposal which outlines their chosen project in more detail. The module will focus on developing student's ability to research the literature, plan a piece of research and communicate their work effectively.

Activities: Including Lectures, Group Activity Sessions, Self-Directed Learning, tutorials, Presentation Session.

Assessment: 100% coursework. Literature review 4000 word; Project proposal 1000 word; Presentation 10 min

Aims: The aim of the module are to develop and consolidate students' ability to effectively use the scientific literature to identify a topic and plan a research project. During the module students will develop their professional competencies and abilities as an Environmental Scientist

Learning Outcomes: • To be able to effectively search and collate literature on a given topic • To be able to design experiments/studies and choose appropriate techniques and statistical tests. • To be able to present their work effectively to both scientific and non-specialists audiences

D224P7 Plant Pests and Diseases (UP)

Module Convenors: Dr Ian Hardy Ian.Hardy@nottingham.ac.uk; Dr Ruth Blunt Ruth.Blunt@nottingham.ac.uk

Module Details: Level 2, Spring Semester, 20 credits

Pre-requisites: None

Co-requisites: None

Expected Number of Students Taking Module: 35

Target Students: Biosciences students studying Agriculture, Agriculture and Crop Science, Environmental Biology, Biotechnology, Plant Science and students in Life Sciences studying Biology

Summary of Content: This module is core for agriculture and crop science students and for non-molecular plant science students and is a recommended option for other agriculture and plant science students, biotechnologists, environmental biologists and biologists. It will introduce students to the importance of interactions between plants, microbes and insects. It will explain the importance and the nature of the organisms that are pests and diseases of plants, including population dynamics and epidemiology. It will also explore the main approaches for control and management of pests and diseases, including chemical interventions, resistance breeding in plants and biological control. Lecture material will be complemented by practical sessions, videos, demonstrations and self-study.

Timetable: Typically one three-hour timetabled session per week (four hours in those weeks that include practical sessions): twenty-five lectures, 12 hours practicals/demonstrations. Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Lecture Programme: Lecture programme is provisional and more detailed information will be given to you in the first session.

Module Name	**Plant Pests and Disease**	**Module Code**	**D224P7**

N.B (if any): MD = Matt Dickinson; RB = Ruth Blunt; IH = Ian Hardy; NC = Natalie Chapman

Week	Subject	Format	Staff
19	The concept of plant disease Invertebrates as pests	Lectures	MD RB
20	The causes of disease – fungi, bacteria, viruses, nematodes	Lectures	MD
21	The concepts of biotrophy and necrotrophy Plant pathogen diagnostics	Lectures	MD
22	Basic insect morphology, life cycles, identification Insect reproduction	Lectures	RB

23	Insect feeding Practical week 1	Lecture and Practical	RB IH & MD
24	Insects as vectors Practical week 2	Lecture and Practical	RB IH & MD
25	Insect senses & nervous systems Practical week 3	Lecture and Practical	RB IH & MD
26	Insecticides Practical Demonstrations	Lectures	RB
31	Biocontrol Insect monitoring/IPM	Lectures	IH
32	Disease resistance mechanisms, fungicides and biological control	Lectures	NC
33	Termites and bees Module review & revision topics	Lectures	IH IH & MD

Assessment details

Exam 1	70%	Rogo style exam - Two hours
Coursework 1	30%	Self-study exercise - 1000 word advisory leaflet on a specific pest or disease

Aims: This module will explore the nature and importance of plant pests and diseases, the organisms involved, and the approaches used to control them

Learning outcomes: On successful completion of this module, students will be able to:

- Discuss the importance of plant pests and diseases in World agriculture.
- Explain how microbes and insects cause disease of plants.
- Discuss the methods used to control plant pests and diseases.
- Relate practical skills to plant pest and pathogen identification.

F82228 Patterns of Life (10cr) Autumn

Module Convenor: Dr R Field

School: Geography, University Park

Module Details: Level 2 Autumn Semester, 10 credits

Pre-requisites: F81125 Earth and Environmental Dynamics

Or any introductory Ecology or Biogeography module

Expected Number of Students Taking Module: 10

Target Students: Available to outside students. Not available to non-U21 F800, F801, L700, L701, L7N1, L7T1 or F630 students. Also available to Natural Sciences second-year and third-year students on Geography pathways. Please note that this module cannot be taken with F82328. Students wanting to take 20 credits of this module must take version F82163.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The module focuses on patterns in the distribution of organisms in space and time, and the theories proposed to explain these patterns. The main themes are:

- Biodiversity patterns
- Island biogeography and nature conservation theory
- Ecological succession
- Biological invasions
- Extinction and mass extinctions

Assessment Details:
Exam 1 100% 1.5 hour exam

Aims: The main aims of this module are to develop:

- a broad knowledge of biogeographic patterns
- an understanding of the theories proposed to explain these patterns
- an ability to understand and interpret the biogeographic literature

The primary focus is on patterns manifest at global spatial scales and long temporal scales. This knowledge is the basis for:

- appropriate interpretation of human impacts on the environment
- understanding and evaluating nature conservation theory and practice
- understanding of the diversity and interdependence of the natural world

F82328 Patterns of Life (10cr Spring)

Module Convenor: Dr R Field

School: Geography, University Park

Module Details: Level 2 Spring Semester, 10 credits

Pre-requisites: Any introductory Ecology or Biogeography module

Expected Number of Students Taking Module: 15

Target Students: Available for Geography U21 returners, Erasmus students, and outside students. Not available to non-U21 F800, F801, L700, L701, L7N1, L7T1 or F630 students. Also available to Natural Sciences second-year and third-year students on Geography pathways. Please note that this module cannot be taken with F82228. Students wanting to take 20 credits of this module must take version F82163.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The module focuses on patterns in the distribution of organisms in space and time, and the theories proposed to explain these patterns. The main theme is the process of biogeographical research.

Assessment Details:
Coursework 1 100% Project – 6 pages, not including references and appendix

Aims: The primary focus of the module is on the research process in biogeography. The module aims to develop:

- experience of biogeographical research, including the formulation and implementation of a research question.
- an ability to understand and interpret the biogeographical literature.

Learning Outcomes:
a) Knowledge and understanding

- A deep understanding of one specific aspect of biogeography - to be chosen by the student.

b) Intellectual Skills

- Ability to identify areas of continuing debate among the scientific community
- Ability to understand and critically assess biogeographical literature and use this to develop and implement a research project.
- Skills related to the process of formulating a biogeographic research question, planning and implementing the research via data collection and analysis, and communicating the research effectively.

c) Professional practical skills

- A range of such skills could be developed, depending on the research question chosen for the project - e.g. plant or animal identification skills, new analytical techniques, etc.

d) Transferable skills

- Communication of ideas, findings, principles and theories effectively and fluently by written means.
- Capability to undertake independent/self-directed study to achieve consistent, proficient and sustained attainment.

YEAR 3 MODULES

C135E5 Environmental Pollution Field Course

Module Convenor: Professor George Shaw George.Shaw@nottingham.ac.uk

Module Details: Level 3, Autumn Semester, 10 credits

Module capped at: 18 – You will need permission from the module convenor to take this module unless it is compulsory for your course.

Pre-requisite(s): C123E3 Soil Science

Students who have not attended this module may be considered at the module convenor's discretion. Due to the different locations over which this module is delivered, it may be difficult for a student with a major physical disability to access it. If you are a student with a disability who is interested in this module, please contact the Module Convener to discuss your needs and the feasibility of registering for this module.

Summary of Content: The field excursion will be of one week's duration and will take place in September, immediately before semester 5. The aim is to provide students with practical experience of a range of environmental pollution issues in a region of central Europe which historically has been one of the most polluted areas in the world. Specific issues covered during the excursion will be as follows:

- Soil acidification and forest decline/recovery.
- Contamination of soils and vegetation due to mining and air pollution.
- Biomonitoring using tree rings.
- Lignite mining and combustion, past and present.
- Reclamation of coal and uranium mines and contaminated land.
- Particulate air pollution.

Field activities will be based around Usti and Labem in the northern Czech Republic. A series of field exercises involving sampling and observation will be undertaken, based on the key topics above. These will be followed up by laboratory sessions in semester 5 during which samples collected in the field will be processed and data analysis undertaken. The results will be presented during a seminar session in December at which students will give short (5-10 minute) summary talks on their work during and after the field trip.

Aims: The overall aim is to provide students with practical experience of environmental pollution and its long term effects in a heavily polluted area in central Europe. The field exercises will build on other modules offered by the School, especially those in Research Techniques in Environmental Science, Soil and Water Pollution and Reclamation and Contaminant Fate and Impact. The field excursion will put much of the material presented in each of these modules in a real-world context. Furthermore, students will gain practical experience of foreign field work, working in teams, chain-of-custody issues concerning field samples, in situ and ex situ analysis of samples, oral presentation techniques and report writing.

A contribution of approximately £175 per student will be required towards the cost of travel and accommodation. Module Convenor to confirm cost for 2016/171.

Assessment Details:

Coursework 1 75% One 3000 word report

Presentation 1 25% One short, group presentation (25%), based on field and laboratory work.

Learning Outcomes:

After successful completion of this module students will be able to:

- 1. Describe the history and major sources of environmental pollution in North Bohemia (Czech Republic).
- 2. Plan and execute a field sampling survey in a foreign country, such as the Czech Republic.
- 3. Recognise key practical limitations of overseas field work and suggest solutions to these limitations.
- 4. Implement a series of physical and chemical analyses in the laboratory using samples collected in the field.
- 5. Analyse and interpret a large and varied data set resulting from field and laboratory measurements.
- 6. Communicate and explain the information revealed by the data set using both oral and written methods.
- 7. Work effectively as part of a team in the field and laboratory.

Recommended Reading: Will be announced at the start of the module.

C135E8 Arctic Ecology Field Course

Module Convenor: Dr Sofie Sjogersten Sofie.Sjogersten@nottingham.ac.uk

Module Details: Level 3, Autumn Semester, 10 credits

Module capped at: 20 – You will need permission from the module convenor to take this module unless it is compulsory for your course.

Pre-requisite(s):

If you are a student with a disability, and you have not already disclosed your disability to the module convenor, you should discuss any needs you may have with the module convenor at the point of registering for this module. The University will take all reasonable steps to ensure that any student with a disability is able to access this module.

Summary of Content: The course will focus on the function of arctic ecosystems. We will identify key terrestrial ecosystem drivers and processes in order to gain a broad understanding of arctic areas. During the field course, students will put ecological methodology into practice in projects that analyse landscape patterns and processes in different habitats. The course will also address climate change impacts on arctic ecosystems. The work will familiarise students with ecological methodology, experimental design, data collection and analysis, interpretation and presentation. Students are required to pay a contribution towards the cost of the field course.

The module includes the study of: Diversity in contrasting habitats, ecosystem processes, impacts of climate change on arctic ecosystems.

A contribution of £275 to the cost of accommodation and travel will be required.

Assessment Details:

Coursework 1	100%	Written report 2500 words
Coursework 2	0%	Submission of a completed field note book and adequate contribution to data collection and student behavior (confirming to the Biosciences code of conduct during field courses).

Aims: To provide a sound understanding of important ecological processes that take place within arctic habitats. To provide a basis for the understanding of more applied aspects of the behaviour of these systems (e.g. plant-soil interactions and threats to the ecosystem).

Learning Outcomes:

- The students will be able identify plant species and measure ecosystem properties.
- The students will be able to make and record accurate observations and measurements in the field and in the laboratory.
- The students will be able to analyse and interpret their data.
- The students will be able to understand complex ideas relating to ecosystem functioning and biodiversity and relate them to climate change in the Arctic and ecosystem feedbacks.
- The students will be able to write and construct a scientific report using appropriate styles, conventions, and terminology

C135E9 Computer Modelling in Science: Applications

Module Convenor: Dr Dov Stekel Dov.Stekel@nottingham.ac.uk

Module Details: Level 3, Autumn Semester, 20 credits

Pre-requisites: D224E4 is recommended but not essential. If you have taken neither D224E4 nor maths A-level, please contact the module convenor.

Expected Number of Students Taking Module: 40

Target Students: All School of Biosciences and Natural Sciences students and Ningbo 2+2 Environmental Sciences students (based in Geography).

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The use of computer-based models has become widespread in the biological and environmental sciences. This module contains the development and application of models in the context of biological and environmental sciences. Fundamental methods (e.g. model building, solution of differential equations, steady state analysis, fitting models to data, use of empirical models) are introduced and applied to a number of example applications. The examples include pollutant transfer and fate, population dynamics, protein synthesis, molecular switches and epidemics of humans and animals. Practical work is undertaken using modelling software to illustrate key aspects of the module. The module is designed for students with relatively little mathematical or computing experience or confidence and is an ideal opportunity to develop a knowledge of applying mathematical skills in an environmental science context.

Assessment:

Practical	100%	Patchwork Assessment

Aims: The aim of this module is to show the range of techniques for computer-based models applied to the biological and environmental sciences using suitable important examples

Learning Outcomes: A student who has successfully completed this module should be able to:

(i) Understand and articulate the relevance of computer-based mathematical models to a range of applications in the biological and environmental sciences.
(ii) Construct a simple model from a description of the processes in a biological or environmental system.
(iii) Simulate simple and complex models using appropriate computer software.
(iv) Use appropriate computer software to fit simple models to data.
(v) Critically evaluate a model and its simulation results in the context of the environmental and biological science underpinning the model.
(vi) Write appropriate computer programs to carry out image processing for biological and environmental images.

Reading List: To be given to students at the beginning of the module.

C13582 Biological Photography and Imaging 2

Module Convenor: Mr David McMahon

School: Life Sciences, University Park

Total Credits: 65

Level: Level 3, autumn semester module

Expected Number of Students Taking Module: 80

Target Students: (C100)Biology; (C300) Zoology; (F900) Environmental Science

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: There is a limited number of places on this module. Students are reminded that enrolments which are not agreed by the Offering School in advance may be cancelled without notice. The module will further extend and develop the students' skills of creative and critical biological photography. They will continue to develop the practice and experience gained in the earlier module. Although they will be expected to consolidate and advance their overall knowledge of biological photography, they will be encouraged to demonstrate an increasing expertise in selected subject areas and/or specialist photographic techniques such as digital imaging and manipulation (using Photoshop CS software), digital video photography and editing, ecological, environmental photography, landscapes, macro and long lens photography, specialist lighting etc. Field and studio work will continue to be essential elements of the module.

Assessment Details:

Coursework 1	25%	Personal Project- assessed via mini dissertation and images
Coursework 2	25%	Field Assignment - assessed via written report, power point poster and images
Coursework 3	25%	Light Project- assessed via submitted images
Coursework 4	25%	A written assessment of a current or past photographer's work, evaluating their works, and critically analyzing the images to form a written study of the works and life.

Aims: To provide students with the opportunity to further advance their skills, knowledge and creative abilitity in the art and science of using modern imaging techniques to communicate biological information and to enable them to be particularly suitable to seek employment where a combination of photography, imaging and biology would be advantageous.

Learning Outcomes:
Knowledge & Understanding of:
A1. the relationship between the life and environmental sciences and other disciplines and forms of knowledge (t,l,p,a)

Intellectual skills - the ability to:
B1. critically analyse and interpret published information and data (l,p,a)
B2. think independently while giving due weight to the arguments of others (l,p,a)
B3. understand complex ideas and relate them to specific problems or questions (t,p,a)
B4. acquire substantial quantities of information systematically, process it effectively, and draw appropriate conclusions (t,l,p,a)

B5. make and record accurate observations and measurements (l,p)

Practical skills - the ability to:
C2. articulate knowledge and understanding of scientific concepts (l,p,a)
C3. write and construct scientific documents (e.g. papers, reports, posters etc) using appropriate styles, conventions, and terminology (t,l,p,a)
C4. work safely in the laboratory and the field and to assess related safety issues (t,l,p,a)
C5. undertake appropriate experimental design and statistical analysis (t,l,p,a)
C6. undertake practical experimental work using appropriate equipment and instruments (t,l,p,a)

Transferable/key skills - the ability to:
D1. work productively with others (t,l,p,a)
D2. communicate effectively in writing (l,p,a)
D3. communicate effectively by oral presentation (t,l,p,a)
D4. organise and manage your working time, schedule tasks, and meet deadlines (l,p)
D5. use and access information and communication technology (l,p,a)

C13592 Evolutionary Ecology

Module Convenor: Dr A MacColl

School: Life Science, University Park

Total Credits: 10

Level: Level 3, Autumn Semester module

Expected Number of Students Taking Module: 90

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The module will consider current knowledge of, and research into, the ecological causes and evolutionary processes that govern natural selection, adaptation and microevolution in natural populations. Three approaches to the study of evolutionary ecology will be used: theoretical and optimality models; the comparative method and direct measurement of natural selection in the wild. Approximately one week will be spent on each of the following topics: Natural selection and the causes of evolution. The genetic basis of variation and its maintenance. Evolutionary stable strategies. Evolution of life histories. Competition and evolution. Coevolution of predators and prey. Coevolution of hosts and parasites. Coevolution of mutualists. Ecology and the origin of species

Assessment Details:

Exam 1	60%	Two hour examination
Inclass Exam 1 (Written)	40%	Two tests contributing 20% each

Aims: This module will describe the workings of natural selection in wild populations, the ecology that drives it, the processes that constrain it and the microevolution that results. Students will be encouraged to explore different intellectual tools for addressing questions about nature such as models, observations, experiments and the comparative method, and to think about their strengths and weaknesses. The module is based on a series of lectures and associated, critical discussion of papers from the primary literature.

Learning Outcomes:
a Knowledge and understanding A2. Current trends and developments in Zoology A5. Genetics and evolution of living organisms b Intellectual skills B1. Critically analyse and interpret published information and data B2. Think independently while giving due weight c Professional practical skills C1. Carry out scientific research and evaluate and make use of the material so acquired d Transferable (key) skills D2. Communicate effectively in oral presentation D5. Reflect on and assess their own progress, strengths and weaknesses D7. Work productively with others

C136E6 Environmental Biotechnology

Module Convenor: Dr H West Helen.West@nottingham.ac.uk

Module Details: Level 3, Spring Semester, 10 credits at University Park

Pre-requisites: Completed Part 1 year in Environmental Science, Environmental Biology or Biology

Expected Number of Students Taking Module: 40

Target Students: BSc Environmental Science, BSc Environmental Biology, BSc Biology, BSc Biotechnology Available to JYA/Erasmus students.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This module provides training in environmental biotechnology, with particular emphasis on the interaction between microorganisms and the environment. The main topics covered will be wastewater treatment, bioremediation of organic and inorganic pollutants, microbes as indicators of risk factors in the environment, microbes in agriculture (biocontrol and biofertilisers) and the role of microorganisms in bioenergy production. Each topic will be introduced by a formal lecture followed by workshops during which students will study the topics in greater detail through problem-based learning techniques facilitated by the Convenor and by independent research. Knowledge and understanding of the lecture material will be assessed by Rogo examination and students will present the problem based exercises and case studies within an individual portfolio during the final week of the module.

Further Activity Details: Activities may take place every teaching week of the Semester or only in specified weeks. It is usually specified above if an activity only takes place in some weeks of a Semester. 36 hours of lectures and facilitated workshops

Assessment Details:

Exam 1	30%	1.5 hour examination
Coursework1	70%	Portfolio presentation of case studies and problem based exercises

Aims: To provide students with a sound understanding of microbial ecology, the role of microbes in natural processes and their application in waste water treatment and bioremediation processes.

Learning Outcomes: Knowledge and understanding of: - The way microbes interact with the environment - The applied effects of microbes on the environment and on human activity and welfare. Intellectual Skills - the ability to - Critically analyse and interpret published information and data - Understand complex ideas and relate them to specific problems or questions. Professional Skills - the ability to - Work safely in the laboratory and to assess related safety issues Undertake appropriate experimental design and statistical analysis Transferable Skills - the ability to - Work productively with others - Communicate effectively by oral presentation - Manage and manipulate numerical data.

C136E7 Environmental pollutants: fate, impact and remediation.

Module Convenors: Dr Scott Young Scott.Young@nottingham.ac.uk,Prof George Shaw and George.Shaw@nottingham.ac.uk

Module Details: Level 3, Spring Semester, 20 credits at University Park

Pre-requisites: C123E3 Soil Science (or equivalent)

Expected Number of Students Taking Module: 70

Target Students: F900, F750, C150, F759, FG07, FG08 and Available to JYA/Erasmus students.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This module is concerned with the behaviour and effects of pollutants in terrestrial and aquatic environments and how their impacts can be ameliorated and managed. The focus is on both the scientific understanding of environmental pollutants and on the intervention strategies currently available. Topics covered include study of the common water and soil pollutants: heavy metal contamination of land; radionuclide behaviour in the environment; persistent organic contaminants and pesticides; nitrate pollution of groundwater; pollution of surface waters by agriculture; eutrophication of lakes; acidification of soils and freshwaters; biological monitoring of rivers; ecotoxicology and environmental epidemiology; quantitative risk assessment; land reclamation, including landfill sites.

Module Activities - Combination of lectures, formative tutorials, field visit and associated laboratory work and demonstrations.

Assessment details - Rogo examination (70%, 1 x 2 hours), 2 summative assessments (15% each)

Summative exercise 1. This activity will be based on a half day field visit to Bagworth Heath, Leicestershire. Small groups will carry out several field sampling exercises or demonstrations, on a rotational basis. Data will either be collected directly by the students or will be provided from demonstrations. A 1,000 word report will be written by the students using these data.

Summative exercise 2. This activity is based on extensive geochemical data previously collected over several years at an old lead mine in Clough Wood, Derbyshire. Several geochemical topics will be addressed including an assessment of mining activities on environmental health, geochemical associations, evidence of agricultural impact in stream water etc. A 1,000 word consultancy-style report will be written by the students using these data.

Aims – The aims of the module are to present: a. current scientific understanding of the fate, impact and remediation of environmental pollutants; b. techniques employed in their study; c. methods currently available to manage and mitigate their impact. At the end of the module the students will be able to (i) understand and explain the underlying mechanisms involved in the major problems of terrestrial and aquatic pollution; (ii) make rational decisions regarding remediation of polluted environments; (iii) give relevant advice to managers, planners and other decision makers.

Learning Outcomes - On successful completion of this module, students will be able to:

- Outline the nature and origins of the major environmental pollutants and place these in the context of past and present human activities.
- Discuss and distinguish between the specific behaviour of a range of organic and inorganic contaminants in the terrestrial and aquatic environments.
- Discuss current knowledge gaps in pollutant transformations and dynamics in the environment.
- Make a quantitative risk assessment of environmental contamination and critically appraise current approaches to modelling risk.
- Demonstrate understanding of current waste disposal and management issues.
- Critically compare current and past approaches to contaminated land restoration and management.

C43541 Conservation Genetics

Module Convenor: Dr A Davison

School: Life Science, University Park

Total Credits: 10

Level: Level 3, Autumn Semester module

Pre-requisite(s):

There are no pre-requisite modules. The first year module Genetics, Ecology and Evolution (C11120), the second year module Evolutionary Biology of Animals and the third year module Population Genetics (C43540) are desirable, but not essential.

Expected Number of Students Taking Module: 110

Target Students: Available to all students. CANNOT be taken by students who have taken N13320 Science, Technology and Business

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: This lecture module describes the genetic effects of reduced population size, especially as they relate to the conservation of endangered species. Random genetic drift and inbreeding will be discussed in depth, both from theoretical and practical standpoints. The importance of heterozygosity and the consequences of a loss of genetic variability will be examined, and ways of alleviating these, using both experimental and theoretical approaches. This will lead into a review of the units of conservation from a genetic perspective.

Assessment Details:

Dissertation	90%	2500 words
Coursework 1	10%	Assessed computer based session

Aims: To present an advanced review of the role of genetics in the conservation of endangered species. Objectives: Students completing this module should have acquired an advanced knowledge of the effects of limited population size upon genetic structure; the theory of inbreeding and inbreeding depression in captive and wild populations; the use of genetic technology to investigate population structure; ways of managing endangered species to maximise their genetic variability; and modern views of specific concepts.

Learning Outcomes:

Note taking; literature review; investigation and criticism of scientific literature.

D235P6 Plants and the Light Environment

Module Convenor: Dr Kevin Pyke Kevin.Pyke@Nottingham.ac.uk

Lecturers: Dr Zinnia Gonzalez and Dr Erik Murchie

Total Credits: 10

Level: 3, Autumn Semester

Pre-requisite(s): Normally two plant science modules in previous semesters.

Number of Places: 30

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Module Details: The module provides a wide-ranging, detailed and modern training extending from the cellular to community level, for those with interest in plant physiology, environmental biology, agronomy and horticulture. The module focuses on the influence of the light environment on the physiology of native and crop species. It considers how this knowledge contributes to an understanding of the causes of variations in crop yields and may be used to assist in the search for improved varieties and increased productivity in agricultural systems.

Lecture Programme: To be announced

Week	Lecturer	Topic
1	ZG	1.Light: properties and perception
		2. Light as an ecological signal
2	ZG	1. Phytochrome and photomorphogenesis
		2. Photomorphogenetic mutants and their uses
3		Phytochrome in the natural environment
4	ZG	Phototropism (preparation)
5	ZG	Phototropism presentations and discussion
6	ZG	1. Photoperiodism
		2. Light measurement and endogenous rhythms
7	KP	Light and leaf development
8	KP	Photosynthesis and the light reactions
9	KP	1. C3 photosynthesis and its regulation
		2. C4 photosynthesis and its regulation
10	KP	1. CAM photosynthesis and its regulation
		2. Environmental factors regulating photosynthesis
11	EM	Crops and the Environment

Teaching Staff: ZG – Dr. Zinnia Gonzalez; KP - Dr Kevin Pyke; EM – Erik Murchie

Non Lecture Programme: Student centred exercise

Coursework: Essay and oral presentation

Assessment: Exam 1 75% 2-hour examination. Coursework 1 15% 1,500-word essay. Coursework 2 10% Group presentation

Aims: The module focuses on the influence of the light environment on the physiology of native and crop species. It considers how this knowledge contributes to an understanding of the causes of variations in crop yields and may be used to assist in the search for improved varieties and increased productivity in agricultural systems. The module provides a detailed and modern training extending from the cellular to the whole plant and community levels for those with interests in plant physiology, environmental biology, environmental science, applied biology and crop science.

Learning Outcomes: On successful completion of the module, students will be able to:

1. Synthesise information about how light interacts with plants at a variety of levels; organ, tissue, cell and molecule.
2. Explain how light is absorbed by plants to initiate energy transfer systems and to stimulate developmental pathways of photomorphogenesis.
3. Analyse literature and produce a coherent argument to support or disagree with the Cholodney-Went theory of phototropism.
4. Differentiate between different light signalling pathways in plants and demonstrate how these pathways function in plants.

Recommended Reading: Information to be provided with lectures

D235Z5 Applied Bioethics 1: Animals, Biotechnology and Society

Module Convenor: Dr K Millar (Convenor) Kate.Millar@nottingham.ac.uk

Module Details: Level 3 Autumn Semester, 10 credit

Pre-requisite(s): None

Expected Number of Students Taking Module: 90

Target Students: Students in the School of Biosciences. Available to JYA/Erasmus students.

Teaching Staff: Dr Kate Millar (Centre for Applied Bioethics)

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The module consists of lectures and associated seminars on: bioethical theory, research with animals, animal agriculture, applications of modern biotechnology to animals, animals and professional ethics, generic issues concerning: risk, precaution and trust; political dimensions of the biosciences; research bioethics.

Assessment:
Exam 1 (60%) 2 hour exam
Coursework 1 (40%) - One 2000-word essay

Aims: The module aims to provide students with a sound understanding of widely accepted ethical principles and encourage the application of these insights to the analysis of contemporary issues concerning modern biotechnologies and research in the biosciences, in relation to both humans and non-human species.

The module consists of lectures and associated seminars on: bioethical theory, research with animals, animal agriculture, applications of modern biotechnology to animals, animal and professional ethics, generic issues concerning: risk, precaution and trust; political dimensions of the biosciences; research bioethics.

Learning outcomes:
On successful completion of the module, students will be able to:

- Recognize and explain the ethical dimensions of prominent issues raised by animal-human interactions
- Interpret the main ethical theories and principles and apply these to specific animal and biotechnology cases to inform professional decision-making
- Describe and apply ethical frameworks to analyse specific dilemmas raised by the human use of animal

D236E2 Geobiology

Module Convenor: Dr Barry Lomax Barry.Lomax@nottingham.ac.uk

Module Details: A level 3, 10 credit module taught in the Spring Semester at University Park. The module consists of 10 lectures and two practical classes.

Capped module at 30 – You will need permission from the module convenor to take this module unless it is compulsory for your course.

Pre-requisites: C123E7 Climate Change Science and/or D223E4 Ecosystem Processes

Target Students: BSc. Environmental Science and Environmental Biology

Summary of Content: The course will focus on the processes that govern the interplay between the biosphere and geosphere. It will identify key events and processes in geological It time which demonstrate the geological consequences of evolution. Students will gain understanding of the mechanisms that control changes in the physiochemical environmental and their impact upon evolution and in turn how life has impacted on physiochemical environment.

Lecture Programme: The module will consist of 10 lectures and 2 practical classes involving both laboratory and independent work.

Assessment:
Exam: 50% one, 1.5 hour exam (essay based exam, two questions from a choice of four).

Coursework: 50% course work (two written reports 25% each) based on two separate pieces of practical work (1000 words each).

Aims: Geobiology explores the relationship between life and the Earth's physical and chemical environment over geological/ evolutionary time. The module will focus on the geological consequences of evolution and how life has influenced physical and chemical environment. Topics covered will include:

Origins and evolution of life
Evolution of the atmosphere and biosphere
Geobiology of critical intervals
Palaeobiology and evolutionary ecology

Students will gain understanding of the mechanisms that control changes in the physiochemical environmental and their impact upon evolution. In order to gain a broad understanding the module will explore past changes as seem in the fossil record, together with present day processes that underpin these responses. The lectures and practical classes will give students knowledge of the tools that are used to reconstruct past environmental conditions and the effect of future changes in the abiotic stimuli that drive ecosystem function.

Learning outcomes:
On successful completion of the module, students will be able to:

- Evaluate interaction (feedbacks and feed-forward) between O2 and life over the key intervals in geological time.
- Evaluate interaction (feedbacks and feed-forward) between CO2 and life over the key intervals in geological time.
- Critique various mechanisms proposed for mass extinction events and apply this knowledge to case studies.
- Discuss the Gaia hypothesis within the framework of geobiology.

Recommended text:
Fundamentals of Geobiology (Eds Andrew H. Knoll Don E. Canfield Kurt O. Konhauser) ISBN: 978-1-4051-8752-7 (Wiley Blackwell) £37:50 (Paperback)

D236P3 Plant Disease Control

Module Convenor: Dr R Ray Rumiana.Ray@nottingham.ac.uk

Total credits: 10

Level: 3 Spring Semester

Expected number of Students Taking Module: 60

Target Students: Students in the Schools of Biosciences and Life Sciences

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Module Details: This is a course which deals with the applied aspects of plant disease control, comprising transmission, epidemiology, detection and diagnosis and control options. Control strategies based on application of fungicides, biological control, deployment of disease resistant varieties and biotechnological approaches are described. The relative strengths and weaknesses of the different approaches will be considered.

Lecture Programme 2016-2017

Week Date	Topic	Activity
1	Introduction to the module	RR
	Cause of disease, symptoms and assessment	RR
	The concept of IDM	RR
2	Plant health risk and policy	NB
	Molecular diagnostics	NB
	Plant disease epidemiology	RR
3	Dispersal of plant pathogens	BF
	Case study - phoma in OSR	BF
	Coursework brief	RR
4	Cultural control methods	RR
	Disease resistance	RR
	Tutorial	RR
5	Durable resistance	GJ
	Breeding for disease resistance	GJ
	Tutorial	RR
6	Field walk	RR
7	Cereal diseases	RR
	Management strategies	RR
	Chemical control	RR

8	Fungicide mode of action	RO
	Fungicide resistance	RO
	Tutorial	RR
9	Virus transmission and sugar beet diseases	MS
	Integrated pest management	TB
10	Nematodes and potato diseases	MB
	Independent studies	
11	Student presentations MSc,	RR
	Feedback and module overview	

RR= Dr Rumiana Ray, NB= Prof Neil Boonham (Fera), TB= Prof Toby Bruce (Rothamsted Research), MS= Dr Mark Stevens (BBRO), MB= Dr Matt Back (Harper Adams University), GJ= Prof Graham Jellis (formerly HGCA), RO= Prof Richard Oliver (Curtin University), BF= Prof Bruce Fitt (University of Hertfordshire)

None Lecture Programme: Practical exercise to support taught material ondiagnosis.

Assessment: Exam 1 100% 2 hour examination

Aims and Objectives: The module aims to instruct students in the current practices, which are available for crop protection, and to provide an understanding of how new measures are developed. The objectives of this module are to enable students to: i) appreciate the problems associated with plant disease ii) develop an understanding of the crop protection options available iii) develop laboratory skills associated with disease diagnosis iv) understand the commercial considerations associated with crop protection

Learning outcomes: On successful completion of the module, students will be able to:

- Compare the strategies used by plant pathogens to spread between plants and cause disease epidemics
- Critically analyse methods available for disease diagnosis in different situations
- Explain the range of approaches used in plant disease control
- Evaluate the strengths and weaknesses of these methods when used in crop protection

D236P7 Plants and the Soil Environment

Module Convenor: Prof MR Broadley Martin.Broadley@nottingham.ac.uk

Lecturers: Dr MJA Foulkes, Dr A French, Dr NS Graham, Dr D Wells

Total credits: 10

Level: 3, Spring Semester

Pre-requisite(s): D223P9 Applied Plant Physiology: from Cell to Crop

Expected Number of Students Taking Module: 40

Target Students: Students in the Schools of Biosciences and Life Sciences.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Module Content: This module provides a detailed study into below-ground biological processes which influence the uptake of water and nutrients by plants. The module considers the acquisition of water and nutrients by plants in both agricultural and natural systems, and how plants interact with the soil environment. Consideration is given to using this knowledge to improve crop productivity and resource management and to understanding how resource capture by plant roots has influenced plant evolution over wider timescales. The module includes a practical study component on the development of new methods and technologies for below-ground phenotyping of roots. The module provides a detailed and modern training extending from cellular to whole organism level. It is highly suitable for those with interests in plant physiology, environmental biology, environmental science, biology, and crop science.

Module Synopsis:

1 Soil structure, movement of water in soils, plant root growth in soils (MB)
2 Water uptake by plant roots, shoot factors controlling water transport, plant adaptations to drought/waterlogging (MB)
3 Nutrition: movement of macro and micronutrients to roots in soils, root uptake mechanisms, transport (MB) Nutrition: plant adaptations to hostile mineral soils (salinity and metals) (MB)
4 Nutrition: evolutionary and ecological aspects of nutrient capture by plants (MB, PW)
5 Breeding crops for improved resource-use efficiency (water and nutrients) (JF)
6 Plant root phenotyping practical and data analysis (AF, DW, MB, NG)

Assessment: Exam 1 75% 2 hour examination - 2 essay style answers from 4 or 5 questions in two sections covering the water relations and nutrition elements of the module. Coursework 1 25% – Data analysis/report on phenotyping plants in the soil environment (1000 words or equivalent).

Aims and Objectives: To provide a fundamental understanding of how water and nutrients are acquired by plants from the soil environment, and their influence on plant growth and development. By the end of the module, students should understand: (i) the pathways and mechanisms involved in the uptake, transport and use of water and nutrients; (ii) the impact of water and nutrient availability on plant growth and development and crop productivity; (iii) plant adaptive responses to water and nutrient stress; (iv) methods to study roots in the soil; (v) how knowledge of water and nutrient uptake by plants can be used to improve crop productivity and resource management.

Learning outcomes: On successful completion of this module, students will be able to:

- Describe how water and nutrients are acquired by plants from the soil.
- Describe the evolution of root adaptations which enable plants to thrive in environments with limited or excess water and nutrients.
- Explain how knowledge of water and nutrient uptake by plants can be used to improve crop productivity and resource management, and the phenotyping techniques used to do this.
- Analyse high-throughput phenotyping data, including computer-based image analysis techniques.

Recommended Reading: Reference lists are provided by each lecturer at the beginning of their section of the module.

D236Z6 Applied Bioethics 2: Sustainable Food Production, Biotechnology and the Environment

Module Convenor: Dr K Millar Kate.Millar@nottingham.ac.uk

Module Details: Level 3, Spring Semester, 10 credit

Pre-requisites: D235Z5 Applied Bioethics 1: Animals, Biotechnology and Society.

Applied Bioethics 1 except in the exceptional circumstances where the student already has an appropriate academic background.

Expected Number of Students Taking Module: 60

Target Students: Students in the School of Biosciences. Available to JYA/Erasmus students

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Summary of Content: The module consists of lectures and associated seminars on: bioethical theory; the ethical dimensions of the nutritional needs of the global population; ethics of population management, use of new reproductive technologies and development; agricultural practices designed to meet the nutritional needs of the global population (including the use of GM crops); the impacts of agricultural and industrial activities on the sustainability of the global environment.

The timetable will be finalised at the beginning of the semester.

Teaching Staff: Dr Kate Millar (Centre for Applied Bioethics)

Assessment:

Coursework 1	(50%)	One 2000-word essay
Coursework 2	(30%)	One 1000-word position paper
Oral Assessment	(20%)	Assessed oral presentation

Aims: The module aims to provide students with a sound understanding of widely accepted ethical principles and encourage the application of these insights to the analysis of contemporary issues in the agricultural, food and environmental sciences.

Learning outcomes:
On successful completion of the module, students will be able to:

- Recognize and explain the ethical dimensions of prominent issues raised by agricultural practices (including the use of biotechnology) designed to meet the nutritional needs of the global population.
- Demonstrate how ethical theory can inform professional choices and public policies related to food production and environmental management.
- Using team-based approaches to apply value-aware communication skills to discuss the ethical dimensions of agriculture and food production.
- Set out and support an ethical position on an agricultural or environmental issue by applying arguments that draw on science and ethics literatures.

D23BE1 Research Project in Environmental Science

Module Convenor: Dr Sofie Sjogersten Sofie.Sjogersten@nottingham.ac.uk

Module Details: Level 3, Full Year, 40 credit

Pre-requisites: Only available to students on the Environmental Science course with honours

CAPPED MODULE – You will need permission from the module convenor to take this module unless it is compulsory for your course.

Expected Number of Students Taking Module: 40

Target Students: Registration for the BSc degree in Environmental Science.

Summary of Content: Final year BSc research projects in Environmental Science are undertaken over semesters 5 and 6 as one 40 credit module. The principal module activities will be (i) setting up and carrying out the practical work and analyse the results critically, (ii) presentation of a research seminar to staff and peers and (iii) the submission of a final report in the form of a scientific paper. There is considerable flexibility over the balance of literature and practical work. Projects which are 100% literature-based are just as acceptable as those in which the emphasis is on laboratory or field work.

Timetable: Personal timetables will be available to all students via www.nottingham.ac.uk/studentservices

Lecture Programme: The module will consist of tutorials with supervisor and independent research by the students.

Assessment Details:

Coursework 1	100%	Submission of research paper based on practical project work (< 5000 words) (70 % of the mark). Supervisors mark based on effort and skill shown during practical component of the project (15%). 15-20 minute seminar presentation (15 %). *

Coursework: A report will be submitted in the first week of the November. This will be < 5000 words and should include the following components: a) a review of the literature which relates to the project area; b) a project plan for experimental and/or literature work in semesters 5 and 6. The relative weighting of these components and the detailed structure of the reports is decided in consultation with the project supervisor. This is because the range of project topics available dictates that progression in different components will proceed at different rates over semesters 5 and 6 and the overall balance of the report will vary considerably between projects. The research paper based on the practical work (< 5000 words) will be submitted in the first week of May.

Aims: This module will help develop skills associated with (i) planning and undertaking independent research work, (ii) presenting research findings to an audience of peers (iii) writing scientific papers. This module enables you: 1. Plan research work in co-operation with your supervisor and technical staff. 2. Effectively manage your time. 3. Assimilate new practical and intellectual skills associated with the subject of your project. 4. Present your work to an audience of staff and your peers. 5. Write a final report, in the form of a scientific paper, in accordance with editorial guidelines. The written work is assessed using the School's Qualitative Assessment Criteria for essays and reports and the seminar using the guide for oral presentations.

Learning outcomes:

- The students will be able to critically analyse and interpret published information and data.
- The students will be able to acquire substantial quantities of information systematically, process it effectively, and draw appropriate conclusions.
- The students will be able to undertake appropriate experimental design and statistical analysis.
- The students will be able to undertake practical experimental work using appropriate equipment and instruments.
- The students will be able to communicate effectively both orally and in writing
- The students will be able to organise and manage their working time, schedule tasks, and meet deadlines.

30 Appendices

1 Qualitative Assessment Criteria - General Guidelines for Examinations
2 Qualitative Assessment Criteria - General Guidelines for Essays & Reports
3 Qualitative Assessment Criteria - General Guidelines for Posters
4 Qualitative Assessment Criteria - General Guidelines for Oral Presentations
5 Qualitative Assessment Criteria – Research Project Experimental Work
6 Progression and Compensation Charts
7 Marking at Different Levels within Degree Programmes
8 School of Biosciences Tutoring Statement

Appendix 1

CLASS	%	QUALITATIVE ASSESSMENT CRITERIA - GENERAL GUIDELINES FOR ESSAYS & REPORTS
First **A1** **A2** **A3** **A4**	 100 90 80 73	a. Excellent report structure with professional presentation of figures, tables, diagrams, references etc.; evidence of originality/novelty in presentation. b. Deep understanding of subject; all arguments carefully developed and clearly expounded. c. Considerable and effective use of literature information, beyond that supplied as taught material. d. Clear evidence of critical thinking, originality and novelty.
Upper Second **B1** **B2** **B3**	 68 65 62	a. Well organised report; appropriate choice of illustrative figures, tables, diagrams etc.; clearly presented throughout. b. Sound grasp of subject material; generally logical arguments. c. Reasonable evidence of wider study beyond lecture material. d. Some evidence of independent thinking and originality.
Lower Second **C1** **C2** **C3**	 58 55 52	a. Generally clear report conforming with accepted format but with some errors in style and/or omissions in presentation of illustrative figures. b. Reasonable understanding of subject material, but some flaws in the logic of arguments and factual errors. c. Only limited evidence of wider study and use of literature information. d. Very little evidence of independent thinking or originality.
Third **D1** **D2** **D3**	 48 45 42	a. Little attention given to report structure; limited use of illustrative figures, tables etc.; serious flaws in presentation. b. Limited understanding of subject; considerable factual errors demonstrated. c. Virtually no inclusion of literature information beyond lecture material. d. Virtually no evidence of independent thinking or originality.
Soft Fail **E**	 35	a. Very poorly structured; disorganised; missing sections; minimal presentation of supporting data, figures etc. b. Minimal understanding of subject; serious factual errors; general lack of any logical arguments. c. Virtually no inclusion of literature information. d. No evidence of independent thinking or originality.
Fail **F1**	 25	Very poor coverage of material with little information that is relevant. Virtually no evidence of understanding the question; minimal attempt to provide a structured answer.
Fail **F2**	 10	A few lines of relevant material
Fail **F3**	 0	No relevant material

1. Only broad classes (A,B,C,D and E) have qualitative criteria attached; the division into (e.g.) C1, C2, C3 etc. is at the discretion of the examiner.
2. The qualitative criteria include consideration of :
   a. The quality of the report/essay etc. - the use of sections; diagrams; figures etc.; citation of references; general neatness etc.
   b. Student's knowledge of subject; depth and quality of answer.
   c. Evidence of reading / study beyond regurgitation of standard taught material.
   d. Independent or critical thinking / originality etc.

Appendix 2

CLASS	%	QUALITATIVE ASSESSMENT CRITERIA - GENERAL GUIDELINES FOR EXAMINATIONS
First **A1** **A2** **A3** **A4**	 100 90 80 73	a. Deep understanding of subject; carefully balanced arguments clearly presented; all material highly relevant to the question. b. Considerable and effective use of literature information, beyond that supplied as taught material. c. Clear evidence of critical thinking, originality and novelty d. Excellent structure and good use of illustrative diagrams etc.; evidence of originality/novelty in presentation.
Upper Second **B1** **B2** **B3**	 68 65 62	a. Sound grasp of subject material; presentation of logical arguments relevant to the question. b. Reasonable evidence of wider study beyond lecture material. c. Some evidence of independent thinking and originality. d. Well organised answer; appropriate use of illustrative diagrams; clear presentation.
Lower Second **C1** **C2** **C3**	 58 55 52	a. Reasonable understanding of subject material, but some flaws in the logic of arguments and factual errors; possibly some irrelevant material. b. Only limited evidence of wider study and use of literature information. c. Little evidence of independent thinking or originality. d. Fairly clear presentation; generally conforming with accepted format but with some flaws in style; little use of illustrative diagrams.
Third **D1** **D2** **D3**	 48 45 42	a. Limited understanding of subject; numerous flaws in the logic of arguments; considerable factual errors and/or irrelevant material. b. Virtually no inclusion of literature information beyond lecture material. c. Virtually no evidence of independent thinking or originality. d. Little attention given to structure; very limited use of illustrative diagrams; serious flaws in presentation.
Soft Fail **E**	 35	a. Minimal understanding of subject; serious factual errors; general lack of any logical arguments; considerable amount of irrelevant material. b. Virtually no inclusion of literature information. c. No evidence of independent thinking or originality. d. Very poorly structured answer; disorganised and untidy; missing sections; virtually no use of illustrative diagrams.
Fail **F1**	 25	Insubstantial answer; very poor coverage of material with little information that is relevant. Virtually no evidence of understanding the question and minimal attempt at structure
Fail **F2**	 10	A few lines of relevant material
Fail **F3**	 0	No relevant material

1. Only broad classes (A,B,C,D and E) have qualitative criteria attached; the division into (e.g.) C1, C2, C3 etc. is at the discretion of the examiner.
2. The qualitative criteria include consideration of :
   a. Student's knowledge of subject; depth, relevance and quality of answer.
   b. Evidence of reading / study beyond regurgitation of standard taught material.
   c. Independent or critical thinking / originality etc.
   d. The quality of presentation - structure of answer, the use of sections; diagrams etc., general neatness etc.

Appendix 3

CLASS	%	QUALITATIVE ASSESSMENT CRITERIA - GENERAL GUIDELINES FOR POSTERS
First **A1** **A2** **A3** **A4**	 100 90 80 73	a. Excellent use of headings, text appropriate size, figures and diagrams clear and well-labelled, very easy to follow progression of poster theme. b. Visually very attractive and creative. c. Factually very accurate and informative with clear evidence of extensive knowledge of published literature. d. All relevant aspects of own data presented, where inclusion is appropriate.
Upper Second **B1** **B2** **B3**	 68 65 62	a. Good use of headings, text of appropriate size, some loss of figure clarity or slight errors in labelling, easy to follow progression of poster theme. b. Visually quite attractive and creative. c. Factually accurate and informative with some evidence of knowledge of published literature. d. Most relevant aspects of own data presented, where inclusion is appropriate
Lower Second **C1** **C2** **C3**	 58 55 52	a. Adequate use of headings, text a little too small, figures not clear and inadequately labelled, more difficult to follow progression of poster theme. b. Visually unstimulating. c. Some factual inaccuracies with only limited evidence of knowledge of published literature. d. Several aspects of own data omitted, where inclusion is appropriate.
Third **D1** **D2** **D3**	 48 45 42	a. Very poor use of headings, text too small or hand-written, figures unclear and unlabelled, no obvious progression of poster theme. b. Visually unattractive and dull. c. Many factual inaccuracies with very limited evidence of knowledge of published literature. d. Most of own data omitted, where inclusion is appropriate.
Soft Fail **E**	 35	a. No headings used and poster somewhat disorganised. b. Visually unattractive and dull. c. Inaccurate with virtually no evidence of knowledge of published literature. d. None of own data included.
Fail **F1**	 25	a. No headings used and poster very disorganised and difficult to understand. b. Visually very unattractive and dull. c. Inaccurate with no evidence of knowledge of published literature. d. None of own data included.
Fail **F2**	 10	A few lines of relevant material presented
Fail **F3**	 0	No poster presented

1. Only broad classes (A,B,C,D and E) have qualitative criteria attached; the division into (e.g.) C1, C2, C3 etc. is at the discretion of the examiner.
2. The qualitative criteria include consideration of :
    a. Structure and organisation of the poster.
    b. Visual impact and attractiveness.
    c. Accuracy and completeness of the content.
    d. Where appropriate, inclusion of students' own experimental data.

Appendix 4

CLASS	%	QUALITATIVE ASSESSMENT CRITERIA - GENERAL GUIDELINES FOR ORAL PRESENTATIONS
First **A1** **A2** **A3** **A4**	 100 90 80 73	a. Clearly audible, well-paced presentation delivered without obviously reading from notes in the time allocated. Addressed to the audience. b. Very well-planned with a clear logical structure focused on the topic being presented. Excellent introduction and summary. c. Excellent use of visual aids which are easy to read and understand. Main points of slides clearly explained. d. Content of presentation very well-researched with relevant data where appropriate. Response to questions asked indicates thorough understanding.
Upper Second **B1** **B2** **B3**	 68 65 62	a. Clearly audible, well-paced presentation delivered with some reading from notes in the time allocated. Mainly addressed to the audience. b. Quite well-planned with logical structure focused on topic being presented. Good introduction and summary. c. Good use of visual aids which are quite clear to read and understand. Good attempt to explain main points of slides. d. Content of presentation quite well-researched with relevant data where appropriate. Response to questions asked indicates good understanding.
Lower Second **C1** **C2** **C3**	 58 55 52	a. Audible presentation which may be too fast or too slow. Tendency to read from notes and to address floor or ceiling. May be outside time allocated b. Some flaws in structure and not always focused on the topic being presented. Weak introduction and summary. c. Adequate use of visual aids which are not always easy to read and understand. Little attempt to explain main points of slides. d. Some omissions in literature research and little relevant data presented. Response to questions asked indicates incomplete understanding.
Third **D1** **D2** **D3**	 48 45 42	a. Difficult to hear. Too fast or too slow. Read from notes and little attempt to address the audience. Outside allocated time. b. Poorly-structured, rambling presentation which strays from topic being presented. Very weak introduction or summary. c. Poor visual aids which are difficult to read and understand. Poor explanation of main points of slides. d. Little evidence of literature research and no data presented. Response to questions indicates poor understanding.
Soft Fail **E**	 35	a. Mumbled, halting presentation. Much too fast or too slow. No attempt to address audience and well outside allocated time. b. No discernible structure to presentation with some relevant material. No introduction or summary. c. Very poor visual aids. No explanation of main points of slides. d. Poor literature research and no data presented. Response to questions shows serious weakness in understanding.
Fail **F1**	 25	a. Extremely difficult to hear presentation and well outside allocated time. b. No discernible structure and very little relevant material. No introduction or summary. c. No visual aids used. d. Little evidence of research. Response to questions shows minimal understanding.
Fail **F2**	 10	Very minimal attempt to give a presentation.
Fail **F3**	 0	Failed to give a presentation.

1. Only broad classes (A,B,C,D and E) have qualitative criteria attached; the division into (e.g.) C1, C2, C3 etc. is at the discretion of the examiner.
2. The qualitative criteria include consideration of :
   a. Presentation of talk; audibility, speed, use of notes, addressed to audience, time keeping.
   b. Organisation of talk; logical coherent progression with introduction and summary.
   c. Use of visual aids; clarity and explanation of salient points.
   d. Research and response to questioning; evidence of extensive reading, presentation of own data (where relevant), evidence of wider understanding.

Appendix 5

CLASS	%	QUALITATIVE ASSESSMENT CRITERIA - RESEARCH PROJECT EXPERIMENTAL WORK
First **A1** **A2** **A3** **A4**	 100 90 80 73	a. Extremely independent and able to work with minimal direct supervision. Shows a great deal of initiative and perseverance when things go wrong. b. Very well organised; able to plan time in laboratory/field with minimal assistance. c. Technically extremely competent; learns new methods quickly with minimal training. d. Excellent critical ability and able to appreciate limitations of techniques used.
Upper Second **B1** **B2** **B3**	 68 65 62	a. Able to work independently with little direct supervision. Shows some initiative and perseverance. b. Well organised; able to plan time in laboratory/field with little assistance. c. Technically competent; learns new methods quite quickly when given training. d. Some critical ability and appreciation of limitations of techniques used.
Lower Second **C1** **C2** **C3**	 58 55 52	a. Needs quite close supervision and shows little initiative. Tendency to give up too quickly when things go wrong. b. Quite well organised but needs considerable help to plan experiments and time spent in laboratory/field. c. Technically quite competent, but liable to make mistakes is not supervised closely. Slow at learning new techniques. d. Limited critical ability and little appreciation of limitations of techniques used.
Third **D1** **D2** **D3**	 48 45 42	a. Little or no ability to work independently. Shows very little initiative. Liable to give up when things go wrong. b. Poorly organised; unable to plan time in laboratory/field without direct instruction. c. Technically incompetent. Liable to make mistakes even when supervised closely. Very slow at learning new techniques. d. Virtually no critical ability or appreciation of limitations of techniques used.
Soft Fail **E**	 35	a. No ability to work independently. Minimal effort put into work. b. Poorly organised and liable to miss planned work sessions. c. Technically very incompetent. Often makes mistakes, even when closely supervised. Extremely slow at learning new techniques. d. No critical ability or appreciation of limitations of techniques used.
Fail **F1**	 25	a. Rarely does any experimental work. b. Very likely to miss planned work sessions. c. Often makes errors when carrying our simple procedures. d. No critical ability or appreciation of limitations of techniques used.
Fail **F2**	 10	Very minimal laboratory/field work attempted.
Fail **F3**	 0	No laboratory/field work attempted

1. Only broad classes (A,B,C,D and E) have qualitative criteria attached; the division into (e.g.) C1, C2, C3 etc. is at the discretion of the examiner.
2. The qualitative criteria include consideration of :
    a. Independence and initiative. Perseverance when work does not go according to plan.
    b. Organisational ability; can the student plan their use if time effectively and efficiently?
    c. Technical ability; can the student carry out work competently and learn new techniques quickly
    d. Critical ability and appreciation of the limitations of the work.

Progression and Compensation BSc Hons (to Parts I and II) and MNUtr (to Part I)

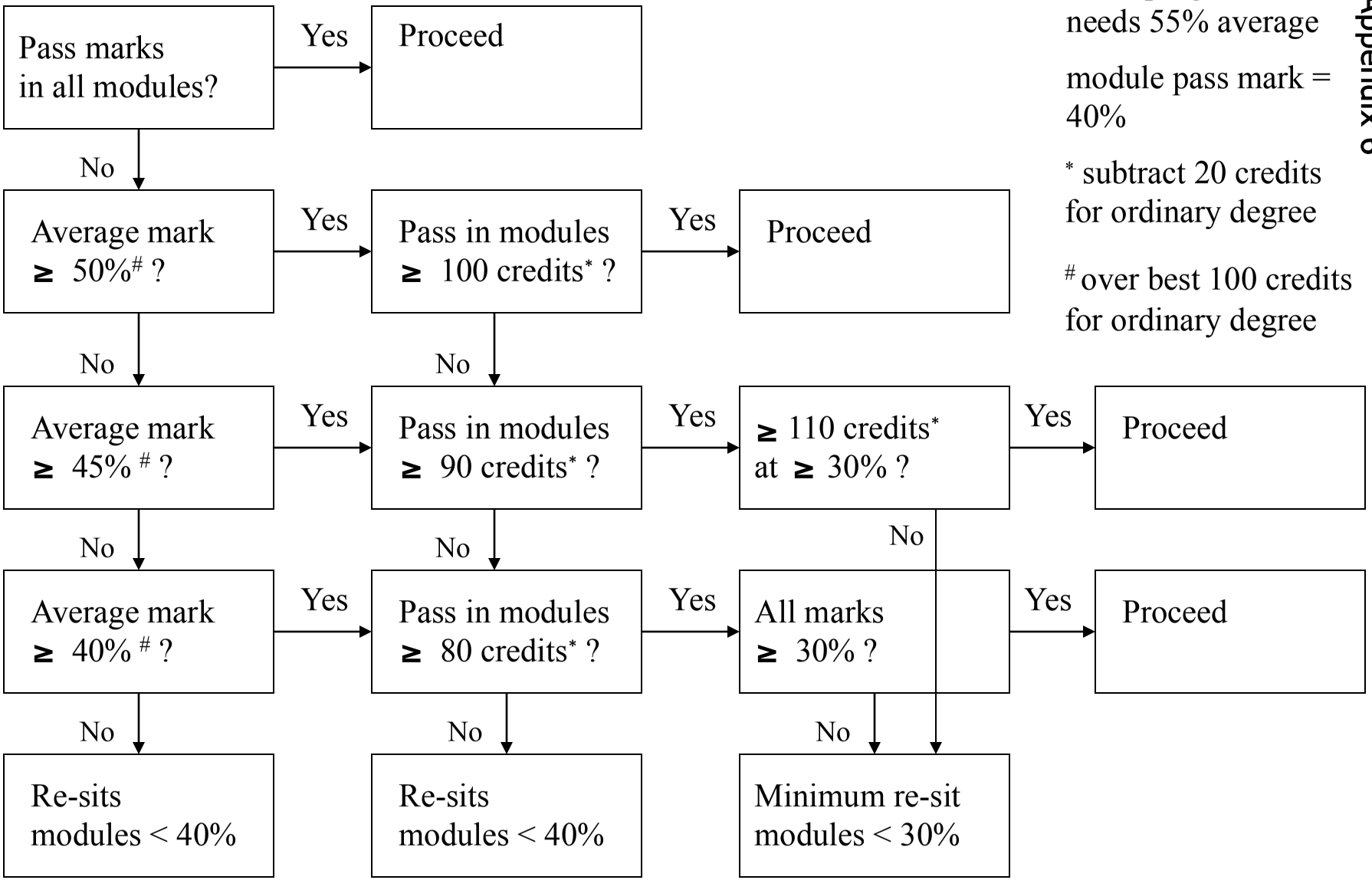
Appendix 6

MSci prog to Part II needs 55% average

module pass mark = 40%

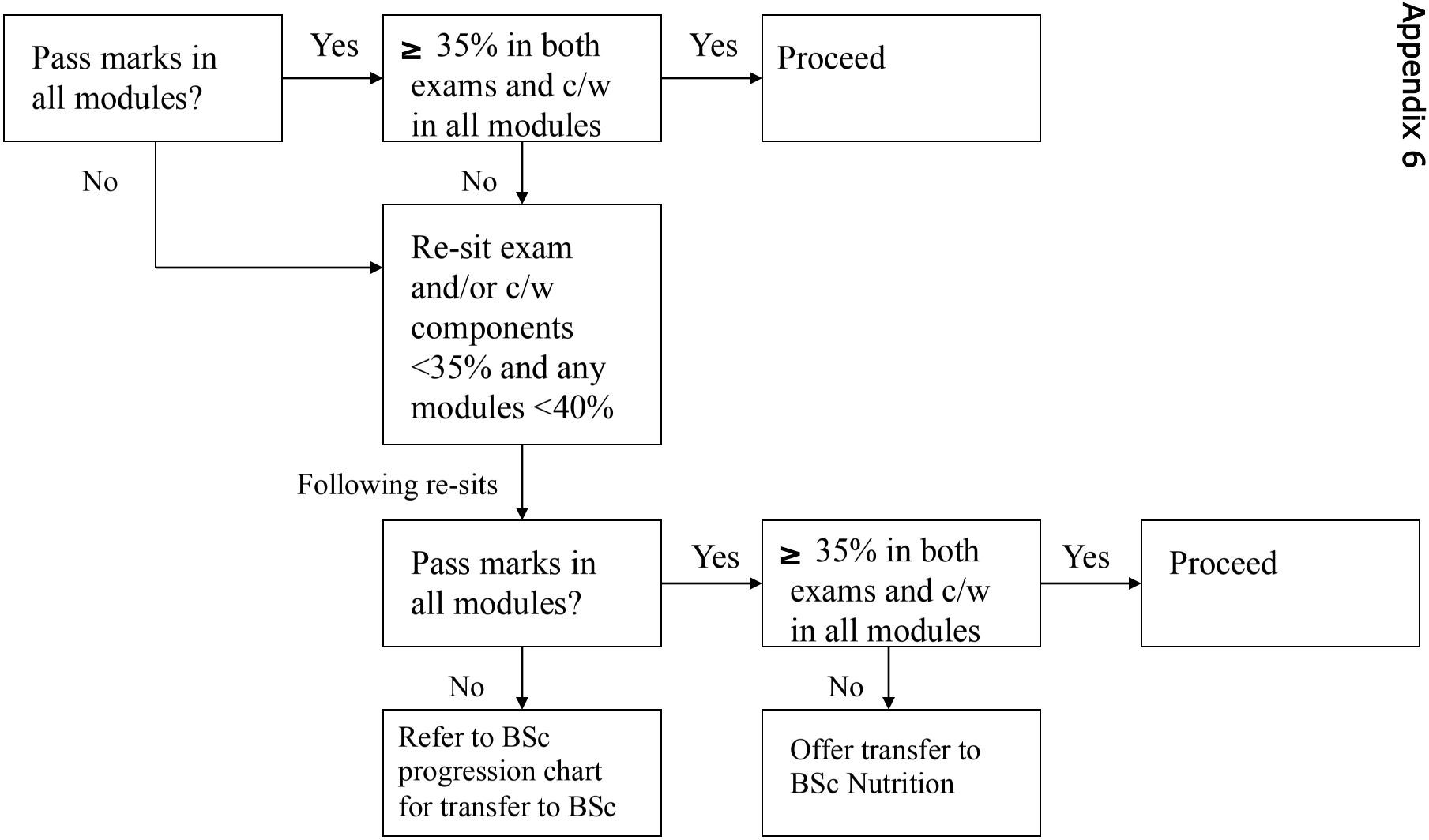
* subtract 20 credits for ordinary degree

over best 100 credits for ordinary degree



Progression and Compensation MNutr (to Parts II and III)

Appendix 6



Appendix 7

School of Biosciences Qualitative Marking Schemes
Supplementary Guidelines

Marking at Different Levels Within Degree Programmes

The School's qualitative marking schemes provide general guidance for assessment of various types of work. However, in applying these schemes to individual assessments, account must be taken of the level at which students are working. The criteria outlined below provide general guidance, and not all criteria will be applicable to all forms of assessment.

Academic Levels

Level 1 Certificate level, generally qualifying year students
Level 2 Diploma level, generally taken by year 2 students
Level 3 Degree level, generally taken by year 3 students
Level 4 Masters levels, generally taken by post-graduate or year 4 undergraduate students

Major considerations

Mark Class A

Level 1: Draws on available evidence to make sound conclusions supported from a range of sources.
Level 2: There is evidence of further reading and careful analysis offering alternative views.
Level 3: There is critical analysis offering alternative views. There is clear expression of own views, which are supported by appropriate literature. Draws on available evidence to make persuasive conclusions.
Level 4: Detailed, orderly and critical work with clearly specified focus/foci exhibiting rigorous analysis, synthesis and evaluation. There must be evidence that the student has developed their own arguments.

Mark Class B

Level 1: Content is accurate and relevant with appropriate use of supporting material.
Level 2: There is sound analysis with good expression and argument with evidence of independent thinking supported by appropriate material.
Level 3: There is sound critical analysis. Alternative views are expressed using supporting evidence from a variety of sources.
Level 4: Evidence of originality and significant critical analysis. There is evidence of integration of material from a variety of sources.

Appendix 7

Mark Class C

Level 1: Content is largely accurate and relevant with some evidence of understanding.
Level 2: There is adequate analysis with limited evidence of wider study.
Level 3: There is reasonable understanding, with some attempt at analysis and limited use of supporting material.
Level 4: There is reasonable understanding and analysis supported by a range of relevant evidence.

Mark Class D

Level 1: Some relevant content but with evidence of only very limited understanding.
Level 2: Some relevant content with limited understanding but little evidence of wider study.
Level 3: Basic understanding with limited evidence of wider study.
Level 4: Basic understanding with limited evidence of understanding and some attempt at analysis.

Mark Classes E/F

All levels: Work does not demonstrate above criteria and reference should be made the qualitative criteria in deciding final mark.

Modules offered at levels A-C are considered intermediate between Levels 1-2, 2-3 and 3-4 respectively.

Appendix 8

School of Biosciences: Tutoring Statement

The following statement demonstrates how each of the specific outcomes of the University's principles of tutoring are delivered in the School of Biosciences.

Principle	Outcome achieved in Biosciences through . . .
1. The student should feel acknowledged, recognised and accepted within their school/department as an **individual** with distinct academic needs and preferences.	A detailed Week One programme incorporating course-specific teaching and learning support sessions. A specific Course Manager for each degree from whom students can obtain individual academic advice. Module registration days (three times/year) when students can obtain individual academic guidance on their module choices. Each student is allocated a personal tutor and this is one of the first people they meet when they arrive in the School.
2. The student should feel part of the school/department **community,** experiencing frequent contact with academic staff on an individual or small group basis and building relations with particular members of staff over an extended period.*	Three formal meetings with tutors/year, in addition to which students are encouraged to meet mid-semester with their personal tutors. Learning Community Forum deals with all issues affecting campus life (eg social, residential and catering) as well as academic issues. Close working relationship developed with project supervisor during final year of studies. Student Guild – an SB-based branch of the Students' Union which has combined social and representational roles. Semester One tutor appointed to give particular assistance to first year students at the start of their course. Semester One discussion group at end of first semester to seek feedback on students' experiences. Most first year students and many from later years reside in Bonington Hall. The Hall is closely integrated with all aspects of Campus and School life and is central to the SB community. Campus-based alumni organisation (OKA) provides continuity for graduates and is also involved with travel awards, fund-raising, communication and development.

3. The **personal development** of the student should be promoted; leading to improved communication skills and greater confidence in presentation and dealing with the unfamiliar.	Many modules require presentations, group working and practical skills to be developed – see: http://www.nottingham.ac.uk/biosciences/study-with-us/employability/employability-skills.aspx. Final year research project involves significant personal development as an individual researcher and scientist. MSci students take undertake an additional project in which their professional skills are further developed. MNutr students undertake clinical placements giving them first-hand experience of communicating with the public. Project assessment includes an oral presentation.
4. Students should receive prompt, helpful and detailed **feedback** on their assessments, in a manner that enhances learning and improves future assessment performance.	Coursework returned to students (within a 21 day turn-around time) with individual comments – often on a standard assessment feedback form. Models of good practice in feedback are provided on School intranet. Standard module feedback which is provided at the end of each module on performance over the course of the module, including the formal summative assessment. Module timetables routinely specify submission and feedback dates for coursework.
5. Students struggling with aspects of individual modules, or more generally with their programme of studies, should have clearly signposted and ready access to a reasonable level of **academic advice and support** designed to remedy their difficulties.	Guidance available from Course Manager, Module Convener, Module Registration Days, Personal tutor and School Office staff. Colleagues from Academic Support hold drop in sessions on campus throughout term-time. In 2014-15, appointment of a new Student Experience and Support Officer.
6. Students should receive the level of support in developing their **study skills** necessary to perform satisfactorily on their programme of studies.	A well-developed Study Skills Handbook, to which students are introduced during a specific session in Week One. Personal tutors also provide study-skill advice. A year-long Academic Development and Employability module delivered to first year students. Provision of self-assessment materials from the Virtual Writing Centre for students' use. Course staff provide specific aspects of guidance, especially in relation to coursework.

	All students receive detailed Module Handbooks appropriate to all years of their course. Year 2 and 3 students receive a detailed Research Project handbook. Information in these documents is explained and reinforced during discussions with Personal Tutors, project supervisors and module staff.
7. Students with **personal circumstances** adversely affecting their studies should feel able to make these known to the school/department without difficulty and to be directed to the appropriate support service.	Personal tutor, the School's Senior Tutors (undergraduate or postgraduate), any other member of academic staff, and/or School Office staff who are available to talk to students about difficulties facing them. All staff are aware of support mechanisms available such as the Student Services Centre and Counselling Service. A well-publicised extenuating circumstances procedure, which students are encouraged to make use of as appropriate. The Student Experience and Support Officer who provides support for students with extenuating circumstances.
8. Students should receive the necessary **careers information, advice and guidance** to equip them to make informed choices about their future, to understand the options open to them, and to take advantage of available opportunities.	Workshops on taking an industrial placement year, CVs and application forms, mock assessment workshops are run by Careers and Employability Service during the Autumn Semester. In addition, regular employer presentations from relevant business are hosted on campus throughout each year. Additional drop-in clinic for CV feedback offered to finalist students in June each year. Careers appointments available on the Sutton Bonington Campus throughout the year. 2014-15 a new Careers Fair held on campus in February. MSc mentoring scheme for interview skills/CV development. Some modules deliver integral employability skills. Guidance from tutor, PhD supervisor/assessor and external lectures.
9. Students should be made aware of the importance of developing and articulating their **employability skills**, including possible participation in the **Nottingham Advantage Award.**	Course and subject area staff provide guidance on opportunities in their own disciplines or facilitate connections with specialist resources/alumni/industrial partners/research organisations. Some subject areas promote placement opportunities directly; an Industrial Placement Officer provides general employment advice and opportunities for year-long internships

	Personal tutors provide general employment guidance. Additional School Placement Officer to be recruited for start of 2015-16. Personal tutors, project supervisors and other staff provide referee statements to support employment applications. Introduction to the Nottingham Advantage award given during formal Week One Induction programme and students supported to achieve this. Integral employability skills built into the second year and MSc curriculums.
10. Students should receive appropriate advice and support when considering **changing their programme of study** or contemplating **leaving the University**.	The following sources of advice and support are available to students considering changing their course of study or withdrawing from the University: Personal Tutor, Course Manager, School Manager (Academic Administration), Student Services – financial team. These resources are detailed in the Study Skills book.
11. Students should be prepared for **periods of study away** from their home campus and appropriately supported during those periods.	Students receive general information during Week One induction about the possibilities for study abroad. Students following specific courses where placement is a recognised option or obligation receive guidance and support from course staff and from the ERASMUS and Study Abroad Coordinator, and Industrial Placement Officer. Students undertaking a period of study at the Malaysian campus are provided with School briefing prior to departure. The provision of continued support for students who are studying away is a defined responsibility of personal tutors.
12. The procedures for submitting **extenuating circumstances** regarding assessments should be straightforward and well publicised.	Information about the extenuating circumstances process which is provided to all students through the Study Skills Handbooks. This is articulated to students during Week One induction. Reminders about how and when to submit extenuating circumstances which are sent to students twice/year. Tutors, Course Managers and Student Experience and Support Officer who are all able to give advice and support to students with extenuating circumstances.

13. Students with **disabilities** should be clear as to the support they will receive and where it is available, and the support should be in line with University policies.	The Study Skills Handbook which gives information about support available for students with disabilities. This is articulated during Week One by the Disability Liaison Officer (DLO) who gives a presentation to all new students. The DLO provides support to students throughout their course, and directs students to relevant support services. Tutors who are trained to deal with students with disability. A close working relationship which is maintained between the School's DLO and the University's Senior Disability Officer, who is available on the Sutton Bonington campus once/week.
14. The procedures for submitting **academic appeals and complaints** should be well publicised and staff should be aware of their responsibilities within these procedures.	The process for submitting academic appeals and complaints which is publicised in the students' Study Skills Handbooks and Course Handbooks. The School Manager (Academic Administration) who gives advice and support to students who wish to submit a complaint or an appeal. Guidance available from tutors and Course Managers. Learning Community Fora provide an opportunity for complaints to be resolved informally.
15. Students being subjected to the **academic offences** procedure should receive clear information and advice.	Information about what constitutes plagiarism and how to avoid it which is provided in the students' Study Skills Handbooks and Course Handbooks. This information is articulated in a dedicated session during Week One. On-going guidance on how to avoid plagiarism provided by module conveners and tutors. Personal tutors and the School Manager (Academic Administration) who give support for students being subjected to the academic offences procedure.
16. Students should receive relevant **health and safety** guidance, especially in laboratory or workshop-based subjects.	General information on health and safety is provided to all students during Week One induction and in the School's Study Skills Handbooks. Specific information related to laboratories and practical classes is included in module documentation. Students' attention is drawn to safety matters, including risk assessments and safety procedures, by individual course staff at times appropriate to their application. Some courses, such as those where pathogens will be used, contain a compulsory lab safety module.
17. Students should be directed in a timely and appropriate manner to	The School's Study Skills Handbooks, Course Handbooks, Personal Tutor, Senior Tutor,

University support services for assistance with all of the above matters as necessary.	School Office staff and the Student Services Centre.

The student Study Skills book is produced annually and provided in hard copy to all new students. It can also be found online at http://www.nottingham.ac.uk/~sazintra/student/current/docs/Biosciences%20Study%20Skills%20-%20updated%20July%202014.pdf

January 2015

Appendix 8