- **1 Awarding Institution**University of Newcastle upon Tyne
- **2 Teaching Institution** University of Newcastle upon Tyne
- **3 Final Award** BSc (Hons)
- 4 **Programme title** Biology
- 5 **Programme Accredited by**:
- 6 UCAS Code C120

7 **QAA Subject Benchmarking Group(s)** Organismal Biology

8 Date of production/revision Produced April 2002/Revised August 2004

9 **Programme Aims:**

- a) To develop a thorough knowledge and understanding of Biology and the associated practical skills.
- b) To introduce the main disciplines underpinning the understanding of biology, such as biochemistry, cell biology, physiology, genetics, microbiology, ecology, evolution and systematics.
- c) The course will progressively develop student's skills and interests. By Stage 3 there will be opportunity to study more specialised aspects of the subject and carry out independent investigative and analytical studies in greater depth.
- d) To provide a Biology curriculum enhanced by an active research environment that will encourage critical thinking.
- e) To stimulate an informed interest in Biology and engender an awareness of how current developments in biology affect the overall well being of our planet and society.
- f) To give students more general (key) skills including the ability to communicate effectively, employ IT and library resources, prioritise work and to meet deadlines and to work independently and in teams to solve problems.
- g) To provide a flexible programme which fully meets the Quality Assurance Agency Benchmark Statement for 'Biosciences'.
- h) To lead to a qualification which meets the criteria of the Honours level of the National Qualifications Framework for England, Wales and Northern Ireland
- i) To provide an environment within which students can enjoy and be enthused by their learning experience.
- j) To give awareness of new technologies and the skills and aptitudes needed for the development of a wide variety of careers, both within and without Biology

10(a) Programme Intended Learning Outcomes:

A Knowledge and understanding

- A1 A knowledge of biology from the subcellular to the community level.
- A2 An understanding of the functioning of plants, animals and micro-organisms at the physiological and biochemical levels, with particular reference to environmental adaptation and responses to stress.
- A3 A knowledge of the diversity of living organisms and knowledge of the principles underlying classification and understanding of phylogeny and biogeography.
- A4 An understanding of ecology, with emphasis on biological and population responses to pollution and climate change and to conservation issues.
- A5 An understanding of interactions between living organisms as symbionts, commensals, parasites and pathogens.
- A6 An understanding of genetics at both the population and molecular levels.
- A7 An awareness of selected current developments in biology and an appreciation of the broader impact these may have on society and the ability to apply such knowledge.

Knowledge and understanding

Teaching Strategy

 A1 – A6 are principally imparted through lectures, which may be enhanced and supplemented with co-ordinated practical work or additional self-paced learning delivered by means of appropriate CAL tutorials. Many of the lecture courses at Stage 3 are particularly important in delivering A7 as they provide knowledge at the 'cutting edge' in the field.

Learning Strategy

Throughout the taught component of the course, students are encouraged and expected to engage in independent reading, and are supported in this by the provision of reading lists, handouts and access to library and web-based resources.

Assessment Strategy

Assessment is partly by way of unseen written examinations (essay-type questions, short answer questions, problem-solving questions as appropriate) and partly by way of coursework. Most modules at stages 1 and 2 include coursework, thus ensuring that elements of formative, as well as summative, assessment and a variety of assessment methods are employed. At stage 3 the distribution of examassessed and in-course assessed work is more polarised between modules, though as at stages 1 and 2 each form a major part of the whole stage 3 assessment.

- BSubject-specific skillsThe programme provides opportunities for students to develop and demonstrate:
- B1. Laboratory and analytical skills including statistical methods, the use of key equipment, instrument calibration and recording measurements with appropriate precision.
- B2 The ability to use keys and field guides to identify plants and animals.
- B3 Appropriate field skills: how to observe, record, and sample plants and animals in the wild.

Teaching strategy

Laboratory skills (B1) are widely developed in practical components, not infrequently large, of subject specific modules. The analytical and statistical aspects of B1 are addressed through specialised modules in stages 1 and 2 and are an important component in many laboratory classes (stages 1 and 2) and in field and project modules (stage 3). The ability to develop identification (B2) and field skills (B3) are developed by specific laboratory and field course modules (e.g. Plant Groups, Biology Field Course & Collection Project, Entomology Field Course).

Learning strategy

Students are encouraged to acquire practical laboratory skills (B1) by the monitored attendance at laboratory classes. Students can further develop the practical and statistical skills they have acquired, through their application in final year field work and research project. The learning of B2 and B3 is particularly reinforced in the compulsory Biology Field Course & Collection Project module.

Assessment strategy

All subject-specific skills are assessed by means of coursework reports, posters, and/or group project work, usually undertaken within the modular context. Some, or all, of B1-3 (depending on topic) are also examined by means of a dissertation and presentation associated with the Final Year project work.

C Cognitive skills

The programme provides opportunities for students to develop and demonstrate:

C1. The ability to use the scientific method by formulating and testing hypotheses and to identify key data which allow such tests to be made.

C2. The ability to interpret and effectively summarise quantitative data including appropriate interpretation and statistical analysis.

C3. The ability to critically assess the value and limitations of existing information on a given subject and produce critical reviews of such information.

Teaching strategy

Some cognitive skills are introduced at stage 1, mainly C2 but for example the concept of hypothesis testing (part of C1) is introduced in the statistical component of Biological Skills and Numerical Methods. These are then further developed at stages 2 and 3 particularly during project work either within modules (such as Biology Field Course & Collection Project, C1-3) or during the final year Experimental Research Project (C1-3) or Biological Information Project (C2 and 3). The skills associated with C3 are also developed in theintroductory tutorials associated with the Library Project and Talk at Stage 3.

Learning strategy

Students are encouraged to acquire C1-C2 skills in the Skills and Numerical Methods in Biology module at Stage 1 and the Quantitative Techniques module at Stage 2. They then have to implement these skills as a key part of the Experimental Research projects at Stage 3, by designing their own experiments and analysis strategy and then appraising the quality of the data collected (C1, C2). The critical C3 skills are also practiced in the process, and in the course work and preparations for formal examinations for other stage 3 modules.

Assessment strategy

Cognitive skills C1 and C2 are mainly assessed by means of coursework (laboratory reports, workbooks). The ability to critically assess and review existing information is tested by the major library project that are undertaken during Stage 3 (C3) and in the General Examination Paper. C3 is also tested to varying extents in formal examinations for specific Stage 3 modules.

D Key (transferable) skills

- D1. The ability to communicate by means of well-prepared, clear and confident presentations, and concisely written documents and follow the accepted conventions for scientific communication.
- D2. The ability to use library and other information sources efficiently and appropriately.
- D3. The ability to use IT resources skilfully and appropriately.
- D4. The ability to plan, organise and prioritise work activities in order to meet deadlines.
- D5. The ability to work independently, with initiative, and also in teams.
- D6. The ability to solve problems and produce reasoned solutions.

Teaching strategy

Key skills are formally taught in a number of specific compulsory modules which cover presentation and scientific writing skills (D1); library and other information skills (D2); and IT skills (D3). Problem solving skills (D6) are encouraged in many laboratory and field work classes at all stages. Management of workload in order to meet deadlines (D4) is promoted by means of a strict coursework timetable (students are encouraged to complete their own Gantt charts which are included in the course handbooks), whilst teamworking skills (D5) are developed by group exercises in a number of modules (e.g. in the skills component of the Stage 1 Skills and Numerical Methods in Biology module and in the Stage 3 Biology Field Course & Collection Project). Many of these and other modules also provide opportunities for students to improve their problem solving abilities (D6) and to extend their communication, library, IT, and time management skills (D1-D4). The application of these skills (D1-D6) is integral to the Stage 3 Research Project and Dissertation and Biological Information Project.

Learning strategy

The learning of these skills by practice with or withour assessment is embedded in the degree at all Stages and in the great majority of modules, though there are also specific modules at each stage that either teach or practice many of these skills. Students must submit regular reports on their laboratory work, as well as dissertations and literature reviews; individual verbal presentations are assessed; formative feedback is given. The development of C1-6 is a key part of project and field work activities.

Assessment strategy

Some key skills are specifically assessed in the specialised skills or library project modules, but many are indirectly assessed through course work and examinations in most modules. Communication (D1), library (D2) and IT (D3) skills, and the ability to meet deadlines (D4) are indirectly assessed by coursework (scientific/technical reports, a poster, literature reviews, essays etc.). Similarly, ability to work independently (D5) implicitly influences the level of achievement in many assessed components; initiative (C5) is implicitly assessed in project activities. Ability to work in teams is assessed indirectly where students work in pairs in some laboratory classes, but directly in some modules where there is an element of peer assessment is included (e.g. Cell Proliferation and Death).

11 Programme Curriculum, Structure, and Features:

A. Programme Structure and Features

This is a three-year full-time modular programme consisting of 120 taught credit at each Stage (year). 10 credits are equivalent to 100 hours of study time (contact time and private study).

At Stages 1 and 2 the emphasis is on ensuring biologists receive a broadly based introduction to the subject, encompassing a wide range of subject areas and covering both animal, plant and microbial examples.

At Stage 1 the compulsory module topics are Form and Function – Cells and Animals, Introductory Biochemistry for Biologists, Plants, Microbes and the Environment, Skills and Numerical Methods for Biologists, Evolution, and Genetics.

Students then select a further 20 credits of optional modules, from a range of biological modules including Behaviour and Ecology, Biodiversity of Marine Animals, and Physiological Psychology with Personality.

At Stage 2 the compulsory modules include those which cover cognitive and key skills (Quantitative Techniques, Communication Skills) and fundamental topics such as Introduction to Molecular Biology, Population Genetics & Natural Selection, Plant Groups and Vertebrate Evolution and Diversity.

60 credits worth of modules are selected from clusters of modules that have been grouped to ensure breadth of biological knowledge is maintained. These give students the opportunity to choose several areas amongst environmental topics, diversity, physiology, biochemistry, development, behaviour, entomology, parasitology, microbiology, and biotechnology.

At Stage 3 compulsory modules comprise the Biology Field Course and Collection Project, Library Project and Talk, Social Impact of Biology and either Research Project and Dissertation or Biological Information Project. Students choose a further 70 credits of subject specific modules. Many of the Stage 3 modules reflect the research interests of the academic staff. Collectively they span the whole of biology, including environmental and ecological topics, through whole organism biology and physiology including adaptation to environment, to cellular, biochemical and molecular topics.

Highlights and special resources:

- Optional Stage 2 (entomology) and compulsory Stage 3 field work modules. Opportunity to use University-owned field stations on the coast and at Close House
- The opportunity to undertake a final year individual project. Access to

excellent laboratory facilities and accessible coastal and inland field station facilities enabling students to undertake project work from the molecular to the community level.

- Newcastle lies on the edge of Northumberland National Park and close to several internationally important National Nature Reserves, including the Farne Islands and Holy Island.
- Access to Botanic Garden and Natural History museum facilities.

B Progr	amme Curriculum						
				(C=Compu Core; O=O			
Code Modul	le Name	Credit	Туре	C110)	Loarn	ing Outcon	nas
	le Maine	Clean	Type	A	B	C	D
Stage 1				1	D	C	D
AGR 112	Introductory Biochemistry for Biologists	20	С	1,2	1	2	1-5
BIO 102	Biological Skills and Numerical Methods	20	С		1	1,2	1-5
BIO 103	Form and Function – Cells and Animals	20	С	1,2	1	2	1,3-6
BIO 104	Evolution	10	С	1,3,4,6		2	3
BIO 106	Plants, Microbes and the Environment	20	С	1-5	1	2	1,3-6
AGR 105	Introduction to Genetics	10	С	1,6		2	1,3,6
BIO 105	Behaviour and Ecology	20	0	1,4,5	1,3	2	1-6
MST 100	Biodiversity of Marine Animals	20	0	1,3,4	1,2	2	1,5
PSY 171	Biological Psychology	10	0	1			
PSY 163	Personality 1	10	0	1			1,4,6
Stage 2							
AES 256	Vertebrate Evolution and Diversity	10	С	1,3	1		
AES 261	Population Genetics and Natural Selection		č	1,3,6	1	2	1,3,5,6
BIO 204	Communication Skills	10	č	1,0,0		-	1,3,3,6
BNS 232	Introduction to Molecular Biology	10	Č	1,2,6			1-6
BNS 233	Quantitative Techniques	10	С	, ,	1	1,2	3
BNS 263	Plant Groups	10	С	1,3	2	,	1,3-5
AES 217	Entomology	10	0	1,3	1	2	1,3,5
AES 218	Entomology Field Course	10	0	1,3	1-3	2	1,2,4
AES 224	Methods in Behaviour	10	0				
AES 225	Microbial Ecology	10	0	1,4		1,3	1,6
AES 230	Functional Plant of Biology	10	0	1,2	1	2	1,4,5
AES 260	Microbial Diversity and its Applications	10	0	1,2,3	1	2	1,3-6
AES 264	Ecology of Populations and Communities	10	0	1,4	1	2	
AGR 224	Animal Parasitology	10	0	1,3,5	1	2	1-6
BIO 200	Metabolism and Development	20	0	1,2	1		1-5
BIO 203	Biodiversity and Conservation	10	0	1,3,4		2,3	1-3
BNS 216	Recombinant DNA Technology	10	0	1,6	1	2	1,2,4-6
MSM 228	Animal Development	10	0	1	1	1-3	1,3-6
MST 201	Tropical Marine Environments and Ecolog		0	1,4			1-6
MST 202	Marine Fouling and Larval Ecology		0	1,4		_	
NEU 201	Comparative Animal Physiology Theory	10	0	1,2		2	1
NEU 203	Comparative Animal Physiology Theory	20	0	1,2	1	2	1
PSY 213	and Labs Motivation	10	0	1			1,6
Other Optional		10	0	1			1,0
EDU 214/914	Student Tutoring	10	0*				1,3-6
EDU 228/928	Advanced Student Tutoring	10	0*				1,3-6
Store 2							
Stage 3 BNS 310	Social Impact of Biology	10	С	7		3	1
BNS 375	Library Project & Talk	10	C	1		3 2,3	1 1-6
BNS 375	Biology Field Course & Collection Project	10	C	1,3,4	2,3	2,3 1-3	1-0 1-6
BNS 396	Research Project and Dissertation	20	0 ^{\$}	1,5,4	2,3 1-3	1-3 1-3	1-0 1-6
BNS 303	Biological Information Project	20 20	0 0 ^{\$}	1	1-5	2,3	1-0 1-6
AES302	Animal Ecophysiology	20	10	0 1,2,	4	2,3	1-0
110302	1-3.5.6		10	0 1,2,	т	5	
AES 303	Animal Population Dynamics	10	0	1,4			1,4,6
AES 311	Comparative Ecology and Evolution	10	0	1,4		3	1,4,6
	of Photosynthesis	10	U	1,4,7		5	1,1,0

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AES 317	Plant Animal Interactions	10	0	1,2,5	3	1
AES 320	Pollution of Air, Water and Soil	10	0	4,7	3	1,3,6
AES 338	Biological Control	10	0	1,5	3	1
AGR 328	Domestic Animal Behaviour	10	0	1	3	1
AGR 344	Parasitology Conference	10	0	5	3	1,3-6
BIO 301	Conservation Biology Issues	10	0	1,3,4	3	1
BIO 302	Biotechnology II	20	0	1,2,6	3	1-6
BIO 303	Cell Proliferation and Death	20	0	1,2	3	1-6
BNS 318	Marine Plants Function and Productivity	10	0	1,2	3	4,6
BNS 326	Environmental Adaptations of Plants	10	0	1,2,4	3	1,2,4,6
BNS 328	Plant Pathology	10	0	1,4,5	3	1-5
CMS 301	Ornithology	10	0	1,3,4		1,5,6
MSM 332	Reproduction and Life History	10	0	1,4	3	1,3,4,6
MSM 347	Behavioural Ecology	10	0	1,4		1
NEU 301	Mechanisms of Behaviour	10	0	1	3	1
^{\$} It is compulse	ory to take either BNS 303 or BNS 378; it is	s forbidd	en to take	both.		
Additional Opt	ional Modules					
EDU 330/930	Student Tutoring	10	0*			1,3-6
EDU 333/933	Advanced Student Tutoring	10	0*			1,3-6
EDU 331/931	Management of Student Tutoring	10	0*			1,3-6
CAS 280/290	Learning from Work	10	0*			1,3-6

12 Criteria for Admission

Students are admitted on an individual basis, with particular conditions tailored to each individual, but typical academic entry requirements are as listed below. Additional qualities such as initiative, organisational abilities, teamworking and demonstrable interest in or experience of the subject, as evident on the UCAS application, are desirable.

GCSE criteria

GCSE Mathematics and Chemistry (or Dual award Science) required if not offered at A or AS level.

A-Level, AVCE, AS Level

BBC/CCC from 18 units including a minimum of 12 units (preferably in science subjects) from 6- or 12- unit qualifications, and preferably including A level Biology. AS level Biology will be considered if offered with other science A levels. Chemistry preferred at AS level if not offered at A level.

Alternative entry qualifications

Scottish Qualifications – AABB/BBBBC at Higher Grade, preferably including Biology, Chemistry and another science subject. Combinations of Highers and Advanced Highers accepted.

BTEC National Diploma – in Applied Science (Laboratory and Industrial Science) at overall Distinction grade.

Accessto HE courses – modules in Biological Science essential and Chemistry, Mathematics or Quantitative Methods desirable (all at Credit level for HEFC).

International qualification - International Baccalaureate 30 points with Higher Level Biology. The equivalent in other qualifications will be considered. Evidence of adequate English language skills (TOEFL score of 575 or an ELTS score of 6.5 or greater) are required.

Mature students - Applications considered on merit, although evidence of recent study is required. Relevant work experience is also useful.

Admissions policy

All applicants are offered the opportunity to visit the Department to find out more about the degree programme, to speak with staff and current students and to see the facilities available.

Many applicants will be offered a place on the basis of their UCAS application alone but students with non- A/AS level or Scottish Higher Grade qualifications may be invited to visit and to have a discussion with the Admissions Tutor or other member of staff before an offer is made.

13 Support for Students and their Learning:

Degree Programme Handbook including:

- Information on the programme including degree and examination regulations, safety issues, assessment criteria and Gantt charts to plan time.
- Module outlines.
- Sources of advice and support.

Induction week programme:

- Tailored for each Stage of the programme to outline the coming year.
- Sessions on how to develop study skills, careers and information on central facilities depending on whether the students are new or returning.

Study skills support

- Introduction to specific study skills relevant to particular Stage of programme introduced in Induction week
- Study skill development included within some modules.
- Study skills support available on self-study basis in Robinson Library

Academic and pastoral support

Students are assigned a Personal Tutor who:

- Provides academic advice on module choice and any other issues, monitors progress and offers guidance where necessary and provides general pastoral care.
- Meets formally with tutees on a termly basis but is available for consultation throughout the year.

The programme is managed by a Degree Programme Director who will provide help to any student on the programme concerning both academic and pastoral matters

The Head of Department ultimately has responsibility for all students in the Department and is available to provide help to any student who needs it

Support for Special Needs

The University and the Student's Union provide a number of central services to support students with special needs:

- Disability Unit
- Student Counselling Service
- Student Welfare

Learning resources

- University Library books, periodicals, journals, databases, electronic resources and self-tuition programmes for study skills plus access to Liaison Librarians.
- University Computing Service access to an extensive range of software and the internet including the provision of a personal University e-mail address and the opportunity to publish web pages.

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- Blackboard a virtual learning environment available through the internet by which staff can provide additional learning support to students on specific modules
- Language Centre high-tech learning facility which is available to all students who would like to improve their knowledge of a foreign language or learn a new one.
- Field stations the University has a number of field stations relevant to biological sciences: Close House Estate, Moorbank Botanical Gardens, Dove Marine Laboratory and research vessel (*RV Bernicia*) and 2 University farms.

14 Methods for evaluating and improving the quality and standards of teaching and learning:

The quality and standards of the programme are monitored by reference to comments from students, staff, employers and external organisations, such as the Quality Assurance Agency, to ensure that the programme achieves its aims and meets the National Benchmarking Statement for the discipline.

Mechanisms for review:

- Module questionnaires issued in alternate years: students evaluate every module by completing a questionnaire which is analysed and then considered by the Board of Studies.
- Teaching questionnaires issued in alternate years: issued to students on every module to comment on the teaching quality of academic staff, the results then being used in staff appraisals.
- Degree programme stage questionnaire issued annually to students on all stages of the programme; results are analysed by the Board of Studies.
- External Examiners' Reports.
- Annual review of progression statistics, degree class achievement, employment.
- Biennial Degree Programme Review.
- Surveys of recent graduates.
- Internal Subject review.
- QAA review.

Committees responsible for monitoring quality and standards

- Board of Studies, whose responsibility is to oversee quality and standard of the programme
- Staff/Student Committee
- Board of Examiners
- Faculty Teaching Committee
- University Teaching Committee

<u>Mechanisms for feedback</u> to students on matters of quality and standards:

- Staff/Student Committee
- Student representation on Boards of Studies
- Circulation via e-mail to all students of Staff-Student Committee minutes
- Stage meetings with DPD.

15 Regulation of Assessment

Assessment rules and Honours Classification

All work is marked against the University mark scheme for which the pass mark is 40% for each module. Modules use a common set of explicit descriptors (provided in the degree program handbook) to asign marks, except where students have been given explicit alternative criteria in advance of specific pieces of work. to which they will apply.

Most modules are assessed by a combination of in-course assessment and a written examination taken at the end of the semester in which the module ends, although some are 100% coursework or examination. A variety of assessment methods are used including assessment of essays, case studies, laboratory reports, oral presentations, poster presentations, project dissertations, unseen examinations and open book examinations. Most work is produced individually but some is teambased. Peer assessment is used both to moderate team marks and to encourage critical appraisal of work and a better understanding of assessment criteria. The methods of assessment, their relative weighting and their timing appear in module outlines which are contained within degree programme handbooks and are available to current students *via* the School of Biology web site.

All modules at Stages 1 and 2 must be passed before progression to the next Stage. There are two resit opportunities. Final degree classification is based on a contribution of 25% of the overall weighted mean of modules taken at Stage 2 and 75% of the overall weighted mean of modules taken at Stage 3. The weighting of marks contributing to the degree for Stages 1, 2 and 3 is therefore 0:1:3. Marks for individual modules contribute to the overall Stage average according to the module's credit rating, ie. the mark for a 20 credit module has twice the weighting of a 10 credit module.

The University's degree classification scale, is as follows:

<u>Mark</u>	Degree Class
>70	First
60-69	Upper second
50-59	Lower second
40-49	Third
<40	Fail

Role of External Examiner

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Assessment is overseen by a Board of Examiners who interpret marks and make recommendations regarding progression and ultimately the class of degree awarded. The composition of the Board is as layed down by the University but all academics concerned with delivering the degree or acting as personal tutor to students on the degree may attend and speak. Information on extenuating circumstances is provided by tutors to a Scrutiny Committee that considers the circumstances and advises the Board of Examiners accordingly.

The External Examiner is an independent expert in the discipline from another university. Their role is to:

- Comment on and approve honours examination papers
- Comment on and moderate the marking of examination scripts
- Comment on and moderate the marking of coursework and dissertations
- Conduct oral (*viva voce*) examinations for a representative range of Stage 3 students and all those falling close to the boundary to a higher Class, all students who have the potential for a First Class award and any student with an overall Fail mark
- Check standards and procedures
- Advise on programme content and methods of assessment

16 Indicators of Quality and Standards:

Taught within a School comprising groups last judged by the QAA as offering "excellent" taught programs.

Good reports in the University's Biennial Taught Programme Review and Internal Subject Review.

Positive External Examiner reports.

17 Other Sources of Information

Additional and contemporary information about this programme can be found in:

Degree Programme Handbooks Programme leaflet

The University prospectus and University Regulations

The University's web page <u>http://www.ncl.ac.uk</u> and links to the School of Biology page.

QAA Subject Review for Organismal Biosciences

http://www.qaa.ac.uk/revreps/subjrev/institution_indexes/uni_of_newcastle_upon_tyne.htm

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This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. It should be noted that there may be variation in the range of learning opportunities reflecting the availability of staff to teach them. While every effort will be made to ensure that the module or modules described in this specification are available, this cannot be guaranteed.

The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.