



**1. Programme title(s) and UCAS code(s):**

Natural Sciences (Life and Physical Sciences) BSc FCG0 BSc/NS

Natural Sciences (Life and Physical Sciences) MSci GFC0 MSci/NS

Natural Sciences (Life and Physical Sciences) BSc with a Year Abroad\*

Natural Sciences (Life and Physical Sciences) MSci with a Year Abroad\*

\*can only be transferred onto when in course

**2. Awarding body or institution:**

University of Leicester

**3. a) Mode of study:**

Full time

**b) Type of study:**

Campus Based

**4. Registration periods:**

BSc

The normal period of registration is three years

The maximum period of registration is five years

BSc with Year Abroad:

The normal period of registration is four years

The maximum period of registration is six years

MSci

The normal period of registration is four years

The maximum period of registration is six years

MSci with Year Abroad:

The normal period of registration is five years

The maximum period of registration is seven years

## **5. Typical entry requirements:**

A/AS Levels: A\*AA-AAB. Including two science subjects at A2. Two AS Levels considered in place of one A-Level. General studies accepted.

EPQ with A-levels: AAB + EPQ at grade B

Core Maths: Grade A (if Maths not held at A/AS-level)

Access to HE (Science): pass full diploma with a substantial number of credits at distinction in science subjects at Level 3.

European Baccalaureate: pass with 85% overall. At least one science must be offered.

International Baccalaureate: pass diploma with 36 points, including at least one Higher Level science at Level 5.

Cambridge Pre-U: D3/D3/D3 in principal subjects.

Other Qualifications: BTEC nationals, international, Irish Scottish, OU, and other qualifications welcomed (when accompanied by satisfactory English Language proficiency for international students).

Pass in the UoL STEM, Biological Sciences or Medicine Foundation Year

## **6. Accreditation of Prior Learning:**

APL will not be accepted for exemptions from individual modules, however may be considered for direct entry to year 2, on a case by case basis and subject to the general provisions of the University APL policy.

## **7. Programme aims:**

The programme aims to

For the BSc: To provide students with

- An applied understanding of the scientific method and its limits
- laboratory experience and a basic aptitude in physical, chemical and biological laboratories
- a sound basic knowledge of IT and computing
- competency in basic mathematics (numeracy, algebra, graphical analysis, elements of calculus, the use and abuse of statistics)
- high level professional and personal skills (presentation, written and oral communication, team work, time management)
- detailed knowledge of one of the following sciences: physics, chemistry, or biology,
- experience in the public understanding of science and the effects of science on society
- ability to critically evaluate scientific publications
- experience of aspects of current research in interdisciplinary areas of science

- independent learning skills

in addition, for the MSci

- ability to undertake extended research in interdisciplinary areas of science
- advanced knowledge of one of the following sciences: physics, chemistry, or biology,

**8. Reference points used to inform the programme specification:**

- Discovery-Led and Discovery-Enabling Learning Strategy 2016-2020
- University of Leicester Periodic Developmental Review Report
- External Examiners' reports (annual)
- Draft Natural Sciences Society Accreditation Criteria

**9. Programme Outcomes:**

Intended Learning	Teaching and Learning	How Demonstrated?
<b><i>(a) Discipline specific knowledge and competencies</i></b>		
<b><i>(i) Mastery of an appropriate body of knowledge</i></b>		
Recall of core information, model problems, experiments and techniques.	Lectures, Specified Reading, Problem-based workshops Independent group discussion, Tutorials	Written examinations Reports and presentations Short answer question sets
Awareness of current issues in Science	Lectures, guided independent study	Written examinations, Reports
And for the MSci:		

<b>Intended Learning</b>	<b>Teaching and Learning</b>	<b>How Demonstrated?</b>
<b>(ii) Understanding and application of key concepts and techniques</b>		
Application of basic concepts. Practical demonstration of experimental method and design.  Use of IT.  Competent use of standard laboratory equipment, knowledge of safety procedures, and applications	Lectures, Tutorials  Laboratory supervision  PBL Workshops  Extended research project  Seminars, guided independent study	Written examination  Presentations  Reports  Laboratory Competency checklist  Short answer question sets  Project dissertation
<b>(iii) Critical analysis of key</b>		
Critical appraisal of scientific literature  Experimental design  And for the MSci: Research design	Laboratory supervision  Group problems  Journal club  Research project	Written examinations,  Journal Club, Peer review element in Undergraduate Research journal  Project progress summary and
<b>(iv) Clear and concise presentation of material</b>		
Presentation of scientific results Participation in scientific discussion	PBL Workshops  Tutorials	Presentations  Journal Club
<b>(v) Critical appraisal of evidence with appropriate insight</b>		
Critical appraisal of scientific literature  Experimental design	Laboratory supervision  Group problems  Journal club	Written examinations,  Journal Club, Peer review element in Undergraduate Research journal
<b>(vi) Other discipline specific competencies</b>		
Practical demonstration of experimental method.	Laboratory classes, Problem BL, Workshops, Peer review	Group coursework  Laboratory competency checklist,  Written examinations
<b>(b) Transferable skills</b>		
<b>(i) Oral</b>		
Response to questioning  Science presentations  And for the MSci: Defence of	Tutorials  Group working observation  Project seminars  Workshops	Presentation assessment  Assessment of responses to questions  Project Viva  Project Viva

<b>(ii) Written</b>		
Ability to compile an appropriate CV	CV Support Session	Formative feedback on CV from PT
Ability to communicate scientific concepts with clarity	Skill workshops	Research lecture reports
<b>(iii) Information</b>		
Use of standard IT packages	Computing Workshops	Assessed tasks Reports
Use of R to to: perform basic data analysis: produce	Laboratory Sessions	
<b>(iv)</b>		
Use of analytical and graphical	Mathematic seminar and workshops	Written examinations Short answer questions
Methods		
<b>(v) Team</b>		
Organization, time management, Interpersonal	Group problem solving, problem- based	Group assessment (outcomes and oral questioning)
<b>(vi) Problem</b>		
Ability to research and problem-solve novel applications	Lectures, PBL workshops,	Short answer questions, Group assessments, project coursework and dissertation
<b>(vii) Information</b>		
Information retrieval	Problem-based workshops	Reports
Analysis of data	Laboratory classes	Experimental summaries
And for the MSci:	Skills workshops	Project progress summary and report

Intended Learning	Teaching and Learning	How Demonstrated?
Outcomes	Methods (b) Transferable skills	
<b>(viii) Skills for lifelong learning</b>		
Use of Study skills and demonstration of Independent learning  And for the MSci:	PBL workshops,  Research project	Project assessments  Report  Project coursework and dissertation

## 10. Progression points:

In cases where a student has failed to meet a requirement to progress he or she will be required to withdraw from the course.

Progression to a discipline specialism will require a pass (over 40%) in significant assessment elements (e.g. sections of examination, end of module coursework) associated with that discipline.

The following additional progression requirements are requested for MSci and BSc year abroad routes, respectively (however, it should be noted that the progression criteria to integrated Master programmes are currently being considered as part of the review of Senate regulation 5; the expectation is the programme will adopt the standard regulations once they are approved).

MSci students may not take any module assessments at attempt three; if MSci fail any credits at attempt 2 they will be transferred to the BSc (reg. 5.15)

MSci progression criteria are as follows:

Year Two CWA

60%+ automatic

55-60% at Teaching Committee discretion following interview and recommendation by Personal Tutor

Year Three CWA

55%

The following progression criteria apply to BSc year abroad:

Year Two CWA

60%+ automatic

55-60% at Teaching Committee discretion following interview and recommendation by Personal Tutor

## **11. Scheme of Assessment**

The programme follows the standard scheme of award and classification set out in the [Senate Regulations 5](#).

## **12. Special features:**

Interdisciplinary modules, ability to specialise in a chosen subject area at end of year one, authentic assessment, embedded skill development, group problem solving, research/ problem-based learning, science communication, Journal of Interdisciplinary Science Topics, opportunity for exchange with comparable programme at McMaster University.

## **13. Indications of programme quality**

- The programme will be subject to standard University of Leicester procedures for quality assessment, including Annual Developmental Review, Periodic Developmental Review, Quality Office review, liaison with College Academic Committee, and the programme will report to the department's Learning and Teaching Committee (L&T).
- An External Examiner will be appointed according to [Senate regulations 7.18-7.60](#).
- There will be systematic, regular evaluation by students registered with the programme, including anonymous evaluation of sessions and modules. A student representative will be invited to attend L&T committee meetings (for unreserved business only).
- The programme's teaching staff will engage with University procedures for peer assessment of teaching and marking.

It should be noted that no competitor programmes are currently accredited, however, the UK Natural Sciences Network/Society is soon to launch a UK Natural Sciences Accreditation Scheme in conjunction with Science Council. The proposer of the Natural Sciences (Life and Physical Sciences) attended the 2016/7 meetings of the Network at which the scheme was discussed. It is expected that the new programme will meet all the criteria for Natural Sciences Accreditation.

## **14. External Examiner(s) reports**

n/a

## Appendix 1: Programme structure (programme regulations)

Students will study a core Natural Sciences first year of problem-based interdisciplinary modules and skills modules. In their second year students will be able to select a specialisation route in either Molecular and Cellular Biology, Organismal Biology, Physics or Chemistry, studying 60 credits from their desired discipline in years 2 and 3 and focusing on this area in their final year project. Alongside this they will continue to study interdisciplinary NS modules which expose them to areas where their chosen research discipline interfaces with the other sciences. Students that are registered for an MSci will study their first three years as described above with an additional fourth year consisting of a 60 credit project in their chosen specialism, a 15 credit Natural Sciences core taught module and 45 credits of taught modules from their chosen specialism.

<b>Year 1</b>	<b>Biological science-focussed interdisciplinary modules (120 credits)</b>
<b>Year 2</b>	<b>Modules from specialisms 60 credits</b>
	<b>Biological science-focussed interdisciplinary modules (60 credits)</b>
<b>Year 3</b>	<b>Modules from specialisms 60 credits</b>
	<b>Biological science-focussed interdisciplinary modules (30 credits)</b>
	<b>Project associated with specialism (30 credits)</b>
<b>Year 4</b>	<b>Interdisciplinary modelling module (15 credits)</b>
	<b>Modules from specialisms (45 credits)</b>
	<b>Project associated with specialism (60 credits)</b>



## BSc NATURAL SCIENCES (LIFE AND PHYSICAL SCIENCES)

### FIRST YEAR MODULES

#### Core Modules

	YEAR LONG	
Modules		Credits
NT1005	LABORATORY, COMPUTING AND SCIENTIFIC SKILLS I	30
NT1006	MATHEMATICS FOR SCIENCE	15
	SEMESTER 1	
Modules		Credits
NT1008	PRINCIPLES OF SCIENCE: BONDS MOLECULES AND CELLS	30

N.B. The majority of teaching for NT1005 takes place in semester 1.

### SEMESTER 2

#### Core Modules

	SEMESTER 2	
Modules		Credits
NT1003	NETWORKS AND CIRCUITS	15
NT1004	BIOPHYSICS, PHYSIOLOGY AND METABOLISM	15
NT1007	SCIENCE, SOCIETY AND SUSTAINABILITY	15

### SECOND YEAR MODULES

#### SEMESTER 1

#### Core Modules

<b>SEMESTER 1</b>		
<b>Modules</b>		<b>Credits</b>
NT2001	ASTROPHYSICS, ASTROCHEMISTRY AND ASTROBIOLOGY	15
NT2003	LABORATORY, MATHEMATICAL AND SCIENTIFIC SKILLS II (Part 1)	15
	MODULES FROM SPECIALISMS (see table below)	30
	<b>Semester Total</b>	<b>60</b>

## **SEMESTER 2**

### **Core Modules**

<b>SEMESTER 2</b>		
<b>Modules</b>		<b>Credits</b>
NT2002	EVOLUTION	15
NT2003	LABORATORY, MATHEMATICAL AND SCIENTIFIC SKILLS II (Part 2)	15
	MODULES FROM SPECIALISMS (see table below)	30
	<b>Semester Total</b>	<b>60</b>

<b>MODULES FROM SPECIALISMS</b>				
<b>MODULE</b>	<b>SPECIALISM</b>		<b>SEMESTER/YEAR LONG</b>	<b>CREDITS</b>
NT2004	MOLECULAR AND CELLULAR BIOLOGY	THE MOLECULES OF LIFE – AN INTRODUCTION TO BIOCHEMISTRY AND MOLECULAR BIOLOGY	SEMESTER 1	30

NT2005	MOLECULAR AND CELLULAR BIOLOGY	PHYSIOLOGY, PHARMACOLOGY AND NEUROSCIENCE	SEMESTER 2	30
NT2004	ECOLOGICAL AND ZOOLOGICAL SCIENCE	THE MOLECULES OF LIFE – AN INTRODUCTION TO BIOCHEMISTRY AND MOLECULAR BIOLOGY	SEMESTER 1	30
NT2006	ECOLOGICAL AND ZOOLOGICAL SCIENCE	GENETICS, BIODIVERSITY AND BEHAVIOUR	SEMESTER 2	30
NT2007	CHEMISTRY	INTRODUCTORY ANALYTICAL AND PHYSICAL CHEMISTRY	YEAR LONG	30
NT2008	CHEMISTRY	INTRODUCTORY ORGANIC AND INORGANIC CHEMISTRY	YEAR LONG	30
NT2009	PHYSICS	MECHANICS, ELECTRICITY AND MAGNETISM	SEMESTER 1	30
NT2010	PHYSICS	LIGHT AND MATTER, WAVES AND QUANTA	SEMESTER 2	30

### THIRD YEAR MODULES

Modules	YEAR LONG Core Modules	Credits
NT3003	INTERDISCIPLINARY RESEARCH JOURNAL	15
	THIRD YEAR PROJECT (see table below)	30
	MODULES FROM SPECIALISMS (see table below)	60
	<b>SEMESTER 1</b>	
Modules		Credits
NT3002	MOLECULAR ANALYSIS AND DESIGN	15

**Third Year Project**

<b><u>Modules</u></b>	<b><u>YEAR LONG</u></b>	<b><u>Credits</u></b>
<u>NT3001</u>	<u>RESEARCH PROJECT III</u>	<u>30</u>
<b><u>OR</u></b>		
<u>NT3300</u>	<u>SUSTAINABILITY PROJECT</u>	<u>30</u>

		<b>MODULES FROM SPECIALISMS</b>		
<b>MODULE</b>	<b>SPECIALISM</b>		<b>SEMESTER/YEAR LONG</b>	<b>Credits</b>
NT3004	MOLECULAR AND CELLULAR BIOLOGY	MOLECULAR CELL BIOLOGY AND GENOMES	SEMESTER 1	30
NT3005	MOLECULAR AND CELLULAR BIOLOGY	BIOINFORMATICS AND BIOCHEMISTRY OF NUCLEIC ACIDS	SEMESTER 2	30
NT3006	ECOLOGICAL AND ZOOLOGICAL SCIENCE	GENOMES, GLOBAL CHANGE AND CONSERVATION	SEMESTER 1	30
NT3007	ECOLOGICAL AND ZOOLOGICAL SCIENCE	NEUROBIOLOGY, ANIMAL BEHAVIOUR AND EVOLUTION IN THE FIELD	SEMESTER 2	30
NT3008	CHEMISTRY	SPECTROSCOPY AND PHYSICAL CHEMISTRY	YEAR LONG	30
NT3009	CHEMISTRY	ORGANIC AND INORGANIC CHEMISTRY	YEAR LONG	30
NT3010	PHYSICS	ELECTROMAGNETIC FIELDS AND RELATIVITY, QUANTUM PHYSICS AND PARTICLES	SEMESTER 1	30

NT3011	PHYSICS	CONDENSED MATTER AND STATISTICAL PHYSICS	SEMESTER 2	30
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## **BSc NATURAL SCIENCES (LIFE AND PHYSICAL SCIENCES) WITH A YEAR ABROAD**

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### **FIRST AND SECOND YEAR MODULES**

As for the BSc in Natural Sciences

### **THIRD YEAR MODULES**

The third year of this programme will be spent studying abroad in an institution on a pre-agreed study abroad programme.

Students will be required to achieve a pass mark in modules taken but these will not contribute to the overall degree classification.

### **FOURTH YEAR MODULES**

As for Year 3 BSc Natural Sciences

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## **MSci NATURAL SCIENCES (LIFE AND PHYSICAL SCIENCES) WITH A YEAR ABROAD**

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### **FIRST AND SECOND YEAR MODULES**

As for the MSci in Natural Sciences

### **THIRD YEAR MODULES**

The third year of this programme will be spent studying abroad in an institution on a pre-agreed study abroad programme.

Students will be required to achieve a pass mark in modules taken but these will not contribute to the overall degree classification.

### **FOURTH YEAR MODULES**

As for Year 3 MSci Natural Sciences.

### **FIFTH YEAR MODULES**

As for Year 4 MSci Natural Sciences.

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## **MSci NATURAL SCIENCES (LIFE AND PHYSICAL SCIENCES)**

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### **FIRST, SECOND AND THIRD YEAR MODULES**

As for the BSc in Natural Sciences

### **FOURTH YEAR MODULES**

<b>Modules</b>	<b>YEAR LONG Core Modules</b>	<b>Credits</b>
NT4001	RESEARCH PROJECT IV	60
NT4002	MODELLING OF COMPLEX SYSTEMS	15
	MODULES FROM SPECIALISMS (see table below)	45
	<b>Total</b>	<b>120</b>

		<b>OPTION MODULES FROM SPECIALISMS</b>		
<b>MODULE</b>	<b>SPECIALISM</b>		<b>SEMESTER/YEAR LONG</b>	<b>CREDITS</b>
NT4003	MOLECULAR AND CELLULAR BIOLOGY	GENETICS: EVOLUTION AND GENE EXPRESSION	SEMESTER 1	30
NT4004	MOLECULAR AND CELLULAR BIOLOGY	CANCER CELL AND MOLECULAR BIOLOGY	SEMESTER 2	15
NT4005	ECOLOGICAL AND ZOOLOGICAL SCIENCE	EVOLUTIONARY GENETICS AND NEUROBIOLOGY	SEMESTER 1	30
PLUS				
NT4006	ECOLOGICAL AND ZOOLOGICAL SCIENCE	MOLECULAR ECOLOGY AND EVOLUTION	SEMESTER 2	15
OR				
NT4015	ECOLOGICAL AND ZOOLOGICAL SCIENCE	BEHAVIOURAL ECOLOGY	SEMESTER 2	15

NT4007	CHEMISTRY	ADVANCED ORGANIC AND INORGANIC CHEMISTRY	Semester 1	30
NT4008	CHEMISTRY	ADVANCED PHYSICAL CHEMISTRY	Semester 2	15
NT4009	PHYSICS	QUANTUM MECHANICS AND RADIATION AND MATTER	YEAR LONG	30
PLUS				
NT4011	PHYSICS	ASTRODYNAMICS	SEMESTER 1	15
OR				
NT4012	PHYSICS	ELECTRONICS	SEMESTER 1	15
OR				
NT4013	PHYSICS	PYTHON	SEMESTER 1	15
OR				
NT4014	PHYSICS	NUMERICAL PROGRAMMING IN C	SEMESTER 1	15

### **Appendix 2: Module specifications**

See attached documents

### **Appendix 3: Skills matrix**

See attached document