## MSci NATURAL SCIENCES (FGC0)

Programme offered at: Durham.

Mode of study: this programme is available full-time.

1. All module selections must be approved by the Sub-Dean of Science.

2. At Levels 1 and 2 students take modules from at least two and no more than four subjects, to a maximum of 80 credits per subject. The selection may include up to 40 credits from outside the list of modules that make up the Natural Sciences programme and must include at least one subject in which Level 4 modules are available.

3. At Level 3 students take modules from at least two and no more than three subjects to a maximum of 80 credits per subject. The selection may include modules from outside the list of modules that make up the Natural Sciences programme to a maximum of 40 credits and must include at least one subject in which Level 4 modules are available.

4. At Level 4 students take modules from at least one and no more than three subjects to a maximum of 120 credits per subject and to include a research project to the value of at least 40 credits

5. Within the Natural Sciences programme certain combinations of modules will be known as Named Routes. Students who follow these combinations of modules will be awarded a specific title for their degree.

6. Students who follow an approved two subject Named Route combination, known as a Joint Honours degree, will be awarded either an M.Sci. in A and B or an M.Sci. in A with B, where A and B are replaced by the approved subject titles. Normally each subject will have a single subject title.

7. In order to qualify for the degree M.Sci. Honours in A and B, students in Levels 2, 3 and 4 normally study modules from two subjects. Students must select between 160 and 200 credits from each of the two subjects during the second, third and fourth levels of the programme.

8. In order to qualify for the degree M.Sci. Honours in A with B, students in Levels 2, 3 and 4 normally study modules from two subjects. Students must select the equivalent of 220 or 240 credits in one subject and 140 or 120 credits in a second subject during Levels 2, 3 and 4.

9. The degree certificate issued to successful students who have not taken an M.Sci. Named Route degree shall list all subjects in which they have taken at least 40 credits during the final three levels of the programme.

10. The MSci in Natural Sciences allows students to take modules from two or more subjects in a four year programme. The range of subjects is limited. Students are allowed to take modules from a single subject in the final year if they have the appropriate prerequisites.

11. The following MSci Joint Honours degrees are available:

### MSci BIOLOGY AND CHEMISTRY

Programme offered at: Durham.

Mode of study: this programme is available full-time.

LEVEL 1 (Certificate)

| | | | | |
|---|---|---|---|---|
| 1-2 | Introduction to Molecular and Cell Biology | | BIOL1072 | 40 |
| 3-4 | Core 1A Chemistry | | CHEM1012 | 40 |
| 5-6 | **EITHER** | Foundation Mathematics (for students who do not have A Level Maths or equivalent) | MATH1641 | 20 |
| | AND | One further 20 credit module chosen from another Board of Studies | | 20 |
| | **OR** | Modules to the value of 40 credits chosen from another Board of Studies | | |

Note:
Students wishing to study for an accredited degree must choose Core Chemistry 1B (CHEM1022) in order to fulfil the laboratory attendance requirements of Royal Society of Chemistry.

LEVEL 2 (Diploma)

| | | | | |
|---|---|---|---|---|
| 1-2 | Core Chemistry 2 | | CHEM2012 | 40 |
| 3 | Ring Chemistry | | CHEM2031 | 20 |
| 4 | Biochemistry | | BIOL2191 | 20 |
| 5 | Cell Structure and Function | | BIOL2211 | 20 |
| 6 | Molecular Biology | | BIOL2201 | 20 |

Notes:
Students who fail to achieve the standard required under the Core Regulations for progression to Level 3 of the MSci in Biology and Chemistry but who achieve the standard required for progression to Level 3 of a Bachelors programme may progress to Level 3 of the BSc in Biology and Chemistry or the BSc in Natural Sciences in the Honours or Ordinary stream in accordance with the Core Regulations;
A student who is qualified to progress from Level 2 to Level 3 of the MSci in Biology and Chemistry but wishes to transfer to Level 3 of the BSc in Biology and Chemistry or the BSc in Natural Sciences shall be permitted to do so.

LEVEL 3 (Degree)

| | | | | |
|---|---|---|---|---|
| 1 | Bioactive Chemistry 3 | | CHEM3211 | 20 |
| 2 | Biological Chemistry | | CHEM2051 | 20 |
| 3 | Advanced Organic Chemistry | | CHEM3031 | 20 |
| 4 | Experimental Cell and Molecular Biology | | BIOL2181 | 20 |
| 5 | Molecular Basis of Disease | | BIOL3221 | 20 |
| 6 | Advanced Biochemistry | | BIOL3371 | 20 |

Notes:
Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may be awarded the degree of BSc in Biology and Chemistry at either Honours or Ordinary level in accordance with the Core Regulations for the award of a Bachelors degree.

LEVEL 4 (Degree)

| | | | | |
|---|---|---|---|---|
| 1 | Research Skills | | CHEM4081 | 20 |
| 2 | Bioactive Chemistry 4 | | CHEM4211 | 20 |
| 3 | Cell Signals and Protein Targeting (MSci) | | BIOL4041 | 20 |
| 4-6 | EITHER | Bioactive Chemistry Research Project | CHEM4272 | 40 |
| | | Biochemistry Research Project (S) | BIOL4031 | 20 |
| | OR | Bioactive Chemistry Research Project | CHEM4271 | 20 |
| | | Biochemistry Research Project (D) | BIOL4022 | 40 |

Notes:
This programme is accredited by the Royal Society of Chemistry until July 2008 as satisfying the academic requirements for the award of Chartered Chemist (CChem) for holders of first or second class honours degrees subject to the selection of modules as indicated above.
Students whose achievement at the end of Level 4 does not qualify them to be awarded the degree of MSci in Biology and Chemistry may be awarded the degree of BSc in Biology and Chemistry with Honours in accordance with the Core Regulations for the award of a Bachelors degree.

**MSci CHEMISTRY AND MATHEMATICS**

Programme offered at: Durham.

Mode of study: this programme is available full-time.

LEVEL 1 (Certificate)

| | | | | |
|---|---|---|---|---|
| 1-2 | Core Chemistry 1A | | CHEM1012 | 40 |
| 3-4 | Core Mathematics A | | MATH1012 | 40 |
| 5 | Core Mathematics B1 | | MATH1051 | 20 |
| 6 | EITHER | Core Mathematics B2 | MATH1041 | 20 |
| | OR | Fundamental Physics A | PHYS1111 | 20 |

LEVEL 2 (Diploma)

| | | | | |
|---|---|---|---|---|
| 1-2 | Core Chemistry 2 | | CHEM2012 | 40 |
| 3 | Properties of Molecules | | CHEM2041 | 20 |

| | | | |
|---|---|---|---|
| 4 | Linear Algebra II | MATH2021 | 20 |
| 5 | Analysis of Many Variables II | MATH2031 | 20 |
| 6 | Mathematical Physics II | MATH2071 | 20 |

Notes:
Students who fail to achieve the standard required under the Core Regulations for progression to Level 3 of the MSci in Chemistry and Mathematics but who achieve the standard required for progression to Level 3 of a Bachelors programme may progress to Level 3 of the BSc in Chemistry and Mathematics or the BSc in Natural Sciences in the Honours or Ordinary stream in accordance with the Core Regulations;
A student who is qualified to progress from Level 2 to Level 3 of the MSci in Chemistry and Mathematics but wishes to transfer to Level 3 of the BSc in Chemistry and Mathematics or the BSc in Natural Sciences shall be permitted to do so.

LEVEL 3 (Degree)

| | | | |
|---|---|---|---|
| 1 | Chemical Physics 3 | CHEM3411 | 20 |
| 2 | Computational Chemistry | CHEM2061 | 20 |
| 3 | Molecules and their Interactions | CHEM3041 | 20 |
| 4 | Electromagnetism III | MATH3181 | 20 |
| 5 | Quantum Mechanics III | MATH3111 | 20 |
| 6 | One 20 credit module chosen from the Level 2 or Level 3 modules offered by the Department of Mathematical Sciences | | |

Notes:
Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may be awarded the degree of BSc in Chemistry and Mathematics at either Honours or Ordinary level in accordance with the Core Regulations for the award of a Bachelors degree.

LEVEL 4 (Degree)
EITHER

| | | | |
|---|---|---|---|
| 1-3 | Chemistry Research Project | CHEM4073 | 60 |
| 4 | Research Skills | CHEM4081 | 20 |
| 5-6 | Modules to the value of 40 credits chosen from the Level 4 modules offered by the Department of Mathematical Sciences | | |

OR

| | | | |
|---|---|---|---|
| 1 | Chemical Physics 4 | CHEM4411 | 20 |
| 2 | Chemistry of Materials | CHEM4451 | 20 |
| 3-4 | Project IV | MATH4072 | 40 |
| 5-6 | Modules to the value of 40 credits chosen from the Level 4 modules offered by the Department of Mathematical Sciences | | |

Notes:
Students whose achievement at the end of Level 4 does not qualify them to be awarded the degree of MSci in Chemistry and Mathematics may be awarded the degree of BSc in Chemistry and Mathematics with Honours in accordance with the Core Regulations for the award of a Bachelors degree.

**MSci CHEMISTRY AND PHYSICS**

Programme offered at: Durham.

Mode of study: this programme is available full-time.

LEVEL 1 (Certificate)

| | | | | |
|---|---|---|---|---|
| 1-2 | Core Chemistry 1A | | CHEM1012 | 40 |
| 3-4 | Foundations of Physics 1 | | PHYS1122 | 40 |
| 5-6 | EITHER | Core Mathematics A | MATH1012 | 40 |
| | OR | Single Mathematics A | MATH1561 | 20 |
| | AND | Single Mathematics B | MATH1571 | 20 |

LEVEL 2 (Diploma)

| | | | |
|---|---|---|---|
| 1-2 | Core Chemistry 2 | CHEM2012 | 40 |
| 3 | Properties of Molecules | CHEM2041 | 20 |
| 4 | Foundations of Physics 2 | PHYS2511 | 20 |
| 5 | Mathematical Methods in Physics | PHYS2521 | 20 |
| 6 | Discovery Skills in Physics | PHYS1011 | 20 |

Notes:

Students who fail to achieve the standard required under the Core Regulations for progression to Level 3 of the MSci in Chemistry and Physics but who achieve the standard required for progression to Level 3 of a Bachelors programme may progress to Level 3 of the BSc in Chemistry and Physics or the BSc in Natural Sciences in the Honours or Ordinary stream in accordance with the Core Regulations;
A student who is qualified to progress from Level 2 to Level 3 of the MSci in Chemistry and Physics but wishes to transfer to Level 3 of the BSc in Chemistry and Physics or the BSc in Natural Sciences shall be permitted to do so.

LEVEL 3 (Degree)

| | | | |
|---|---|---|---|
| 1 | Chemical Physics 3 | CHEM3411 | 20 |
| 2 | Computational Chemistry | CHEM2061 | 20 |
| 3 | Molecules and their Interactions | CHEM3041 | 20 |
| 4-5 | Foundations of Physics 3 | PHYS3522 | 40 |
| 6 | One 20 credit module chosen from: | | |
| | Thermal and Condensed Matter Physics | PHYS2531 | 20 |
| | Stars and Galaxies | PHYS2541 | 20 |
| | Electronics and Physics Laboratory | PHYS2561 | 20 |
| | Theoretical Physics | PHYS3551 | 20 |
| | Laboratory Project | PHYS3601 | 20 |

Notes:
Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may be awarded the degree of BSc in Chemistry and Physics at either Honours or Ordinary level in accordance with the Core Regulations for the award of a Bachelors degree.

LEVEL 4 (Degree)
EITHER

| | | | |
|---|---|---|---|
| 1 | Chemical Physics 4 | CHEM4411 | 20 |
| 2 | Chemistry of Materials | CHEM4451 | 20 |
| 3-5 | Project | PHYS4213 | 60 |
| 6 | One 20 credit module chosen from List A below | | |
| OR | | | |
| 1-3 | Chemistry Research Project | CHEM4073 | 60 |
| 4 | Research Skills | CHEM4081 | 20 |
| 5-6 | Modules to the value of 40 credits chosen from List A below | | |

**LIST A**

| | | |
|---|---|---|
| Atomic and Optical Physics | PHYS4121 | 20 |
| Photonics | PHYS4171 | 20 |
| Condensed Matter Physics 4 | PHYS4111 | 20 |
| Theoretical Physics 4 | PHYS4191 | 20 |

Notes:
Students whose achievement at the end of Level 4 does not qualify them to be awarded the degree of MSci in Chemistry and Physics may be awarded the degree of BSc in Chemistry and Physics with Honours in accordance with the Core Regulations for the award of a Bachelors degree.
Accreditation note:
This programme is provisionally accredited by the Institute of Physics until February 2009.

**MSci E-SCIENCE AND PHYSICS**

Programme offered at: Durham.

Mode of study: this programme is available full-time.

LEVEL 1 (Certificate)

| | | | |
|---|---|---|---|
| 1 | Introduction to Programming | COMP1011 | 20 |
| 2 | Formal Aspects of Computer Science | COMP1021 | 20 |
| 3-4 | Core Mathematics A | MATH1012 | 40 |
| 5-6 | Foundations of Physics 1 | PHYS1122 | 40 |

LEVEL 2 (Diploma)

| | | | |
|---|---|---|---|
| 1-2 | Software Engineering (40 Credits) | COMP2092 | 40 |
| 3 | Core Mathematics B1 | MATH2051 | 20 |
| 4 | Analysis in Many Variables II | MATH2031 | 20 |

| | | | | |
|---|---|---|---|---|
| 5 | Foundations of Physics 2 | | PHYS2511 | 20 |
| 6 | EITHER | Stars and Galaxies | PHYS2541 | 20 |
| | OR | Thermal and Condensed Matter Physics | PHYS2531 | 20 |

Notes:
Students who fail to achieve the standard required under the Core Regulations for progression to Level 3 of the MSci in e-Science and Physics but who achieve the standard required for progression to Level 3 of a Bachelors programme may progress to Level 3 of the BSc in e-Science and Physics or the BSc in Natural Sciences in the Honours or Ordinary stream in accordance with the Core Regulations;
A student who is qualified to progress from Level 2 to Level 3 of the MSci in e-Science and Physics but wishes to transfer to Level 3 of the BSc in e-Science and Physics or the BSc in Natural Sciences shall be permitted to do so.

LEVEL 3 (Degree)

| | | | |
|---|---|---|---|
| 1-2 | Foundations of Physics 3 | PHYS3522 | 40 |
| 3 | Integrative Module – e-Science and Physics | COMP3361 | 20 |
| 4 | Numerical Analysis II | MATH2051 | 20 |
| 5 | EITHER Mathematical Biology III | MATH3171 | 20 |
| | OR Differential Geometry III | MATH3301 | 20 |
| 6 | One 20 credit module chosen from: | | |
| | Advanced Software Engineering (20 Credits) | COMP3221 | 20 |
| | Astrophysics | PHYS3541 | 20 |
| | Condensed Matter Physics | PHYS3531 | 20 |
| | Theoretical Physics | PHYS3551 | 20 |
| | Stars and Galaxies | PHYS2541 | 20 |
| | Thermal and Condensed Matter Physics | PHYS2531 | 20 |

Notes:
Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may be awarded the degree of BSc in e-Science and Physics at either Honours or Ordinary level in accordance with the Core Regulations for the award of a Bachelors degree.

LEVEL 4 (Degree)

| | | | |
|---|---|---|---|
| 1-3 | Project | PHYS4213 | 60 |
| 4-6 | Modules to the value of 60 credits, with no more than 20 credits from Physics, chosen from: | | |
| | Advanced Astrophysics | PHYS4161 | 20 |
| | Advanced Condensed Matter Physics | PHYS4151 | 20 |
| | Advanced Theoretical Physics | PHYS4141 | 20 |
| | Astrophysics 4 | PHYS4131 | 20 |
| | Condensed Matter Physics 4 | PHYS4111 | 20 |
| | Particle Theory | PHYS4181 | 20 |
| | Theoretical Physics 4 | PHYS4191 | 20 |
| | Partial Differential Equations IV | MATH4041 | 20 |
| | Approximation Theory & Solution of ODEs IV | MATH4**1 | 20 |
| | Mathematical Finance IV | MATH4181 | 20 |

Notes:
Students whose achievement at the end of Level 4 does not qualify them to be awarded the degree of MSci in e-Science and Physics may be awarded the degree of BSc in e-Science and Physics with Honours in accordance with the Core Regulations for the award of a Bachelors degree.

**MSci MATHEMATICS AND PHYSICS**

Programme offered at: Durham.

Mode of study: this programme is available full-time.

LEVEL 1 (Certificate)

| | | | | |
|---|---|---|---|---|
| 1-2 | Foundations of Physics 1 | | PHYS1122 | 40 |
| 3-4 | Core Mathematics A | | MATH1012 | 40 |
| 5 | Core Mathematics B1 | | MATH1051 | 20 |
| 6 | EITHER | Core Mathematics B2 | MATH1041 | 20 |
| | OR | Discovery Skills in Physics | PHYS1101 | 20 |

*For those entering in October 2004 onwards, Discovery Skills in Physics (PHYS1101) must be taken in either Level 1 or Level 2.*

LEVEL 2 (Diploma)

| | | | | |
|---|---|---|---|---|
| 1 | Linear Algebra II | | MATH2021 | 20 |
| 2 | Analysis in Many Variables II | | MATH2031 | 20 |
| 3 | EITHER | Complex Analysis II | MATH2011 | 20 |
| | OR | Contours and Hyperbolic Geometry II | MATH2121 | 20 |
| 4 | Foundations of Physics 2 | | PHYS2511 | 20 |
| 5 | Thermal and Condensed Matter Physics | | PHYS2531 | 20 |
| 6 | EITHER | Discovery Skills in Physics | PHYS1101 | 20 |
| | OR | Laboratory Skills and Practice | PHYS2551 | 20 |

*For those entering in October 2005 onwards, Laboratory Skills and Practice (PHYS2551) must be taken in either Level 2 or Level 3.*

Notes:

Students who fail to achieve the standard required under the Core Regulations for progression to Level 3 of the MSci in Mathematics and Physics but who achieve the standards required for progression to Level 3 of a Bachelors programme may progress to Level 3 of the BSc in Mathematics and Physics or the BSc in Natural Sciences in the Honours or Ordinary stream in accordance with the Core Regulations;

A student who is qualified to progress from Level 2 to Level 3 of the MSci in Mathematics and Physics but wishes to transfer to Level 3 of the BSc in Mathematics and Physics or the BSc in Natural Sciences shall be permitted to do so.

LEVEL 3 (Degree)

| | | | | |
|---|---|---|---|---|
| 1-2 | Foundations of Physics 3 | | PHYS3522 | 40 |
| 3 | EITHER | Theoretical Physics | PHYS3551 | 20 |
| | OR | Stars and Galaxies | PHYS2541 | 20 |
| 4-6 | Modules to the value of 60 credits chosen from List A below | | | |

*For those entering in October 2005 onwards, either Theoretical Physics (PHYS3551) must be taken in Level 3 or Theoretical Physics 4 (PHYS4191) must be taken in Level 4.*

**LIST A**

*(Lists A1 and A2 will be offered in alternate years, List A3 will run in both years)*

**List A1 (2005-2006)**

| | | |
|---|---|---|
| Analysis III | MATH3011 | 20 |
| Continuum Mechanics III | MATH3101 | 20 |
| General Relativity III | MATH3331 | 20 |
| Stochastic Processes III | MATH3251 | 20 |

**List A2 (2006-2007)**

| | | |
|---|---|---|
| Elliptic Functions III | MATH3221 | 20 |
| Probability III | MATH3211 | 20 |
| Solitons III | MATH3231 | 20 |
| Statistical Mechanics III | MATH3**1 | 20 |

**List A3**

| | | |
|---|---|---|
| Differential Geometry III | MATH3021 | 20 |
| Dynamical Systems III | MATH3091 | 20 |
| Electromagnetism III | MATH3181 | 20 |
| Mathematics Teaching III | MATH3121 | 20 |
| Operations Research III | MATH3141 | 20 |
| Topology III | MATH3281 | 20 |

Notes:

Students whose achievement at the end of Level 3 does not qualify them to proceed to Level 4 may be awarded the degree of BSc in Mathematics and Physics at either Honours or Ordinary level in accordance with the Core Regulations for the award of a Bachelors degree.

LEVEL 4 (Degree)

| | | | | | |
|---|---|---|---|---|---|
| 1-2 | Modules to the value of 40 credits chosen from List B below | | | | |
| 3-6 | EITHER | | Mathematics Project | MATH4072 | 40 |
| | | AND | Modules to the value of 40 credits chosen from List C below | | |
| | OR | | Project | PHYS4213 | 60 |
| | | AND | One 20 credit module chosen from List C below | | |

## LIST B

*(Lists B1 and B2 will be offered in alternate years, List B3 will run in both years)*

### List B1 (2005-2006)

| | | |
|---|---|---|
| Analysis IV | MATH4201 | 20 |
| Continuum Mechanics IV | MATH4081 | 20 |
| General Relativity IV | MATH4051 | 20 |
| Stochastic Processes IV | MATH4091 | 20 |

### List B2 (2006-2007)

| | | |
|---|---|---|
| Elliptic Functions IV | MATH4151 | 20 |
| Probability IV | MATH4131 | 20 |
| Solitons IV | MATH4121 | 20 |
| Statistical Mechanics IV | MATH4**1 | 20 |

### List B3

| | | |
|---|---|---|
| Riemannian Geometry IV | MATH4171 | 20 |
| Topology IV | MATH4021 | 20 |
| Advanced Quantum Theory | MATH4061 | 20 |

## LIST C

| | | |
|---|---|---|
| Advanced Theoretical Physics | PHYS4141 | 20 |
| Particle Theory | PHYS4181 | 20 |
| Theoretical Astronomy | PHYS4201 | 20 |
| Atomic and Optical Physics | PHYS4121 | 20 |
| Photonics | PHYS4171 | 20 |
| Astrophysics 4 | PHYS4131 | 20 |
| Condensed Matter Physics 4 | PHYS4111 | 20 |
| Theoretical Physics 4 | PHYS4191 | 20 |

Notes:

Students whose achievement at the end of Level 4 does not qualify them to be awarded the degree of MSci in Mathematics and Physics may be awarded the degree of BSc in Mathematics and Physics with Honours in accordance with the Core Regulations for the award of a Bachelors degree.

Accreditation note:

This programme is accredited by the Institute of Physics until February 2009.