

University of Cambridge: Programme Specifications

Every effort has been made to ensure the accuracy of the information contained in this programme specification. At the time of publication, the programme specification has been approved by the relevant teaching Faculty or Department. It is, however, natural for courses to develop and change over time and we reserve the right, without notice, to withdraw, update or amend this programme specification at any time.

NATURAL SCIENCES TRIPOS

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| 1. Awarding Institution | University of Cambridge |
| 2. Teaching Institution | University of Cambridge |
| 3. Programmes accredited¹ by | British Psychological Society The Geological Society Institute of Physics Institute of Materials, Minerals and Mining Royal Society of Chemistry |
| 4. Name of Final Award | Bachelor of Arts (Honours) (for all students) Master of Science (for students who take Part III of the Tripos) |
| 5. Programme Title | Natural Sciences Tripos |
| 6. UCAS Code | BCF0 BA/NS |
| 7. Relevant Benchmark Statements | Biosciences, Chemistry, Earth Sciences, Environmental Sciences and Environmental Studies, History of Science, Technology and Medicine, Materials, Mathematics, Physics and Astronomy, Psychology |
| 8. Qualifications Framework Level | H |
| 9a. Date of Revision | June 2009 |
| 9b. Last Reviewed | June 2009 |

Programme Aims of the Natural Sciences Tripos

The programme aims to:

- provide an education of the highest calibre across all sciences in order to produce graduates of the quality sought by industry, the professions, and the public service, and to provide academic teachers and researchers for the future
- provide a broad introduction to a range of sciences and scientific skills at University level, through having studied at least three experimental science subjects and mathematics to some extent
- allow students to develop specialised knowledge in one or more subjects, by studying these in depth if they so choose
- provide an intellectually stimulating environment in which students have the opportunity to develop their skills and enthusiasms to the best of their potential
- attract outstanding students from all backgrounds

Programme Outcomes for the Natural Sciences Tripos

Students who qualify with a B.A. degree, having taken Parts IA, IB and II of the Natural Sciences Tripos, should have:

¹ For all accredited courses, particular routes through the Tripos are required.

- had experience of a number of broad areas of science from a choice of options, taken to an advanced level, at which current research can be appreciated in some depth
- completed courses designed to increase their understanding of the broad applicability of their chosen subject in the wider context of scientific study
- had experience of independent work, including an introduction to aspects of scientific research
- substantially developed intellectual and professional skills in key areas of science
- substantially developed experimental and data analysis skills through a wide range of experiments in the practical laboratories to illustrate major themes of the lecture courses
- substantially developed communication and management skills through individual and group activities.

Students who qualify with an M.Sci. degree, having also taken Part III of the Natural Sciences Tripos, should have:

- carried out a substantial independent research project in their chosen field and become well-prepared for a career in academic or industrial research.

Teaching and Learning Methods

Each course employs a variety of teaching and learning methods, including lectures, seminars, small-group teaching sessions (supervisions), computer work, practical classes, examples classes, on-line resources, and field trips; not all may be used in each course.

Assessment

The individual courses employ a range of assessment techniques, including unseen written examinations, assessed coursework, experiment write-ups, literature and experimental reports, marked essays, oral examinations and project reports and presentations.

Examiners are appointed separately for each course. In the first and second years of the Tripos (Parts IA and IB) the marks for each course are moderated to ensure a fair and comparable distribution of marks is achieved across each subject. Students are awarded a class based on the aggregate mark of the subjects taken. Class distributions remain constant from year to year and the class awarded is therefore a reflection of the relative standing of the individual candidate in the cohort.

In the third and, where applicable, fourth years of the course (Part II and Part III), examiners award marks and classes based on marking criteria approved by the relevant course organisers and Faculty Board.

Aims, Outcomes and Assessment of Courses

Each major course of the Tripos has identified its aims, learning outcomes, teaching and assessment methods, and any prerequisite courses. These are included as Appendix A.

Support for Students and their Learning

- individual course handbooks, on-line learning resources and web sites (accessible from the NST website www.cam.ac.uk/natscitripos/):
- University, Departmental and College libraries and computing facilities;
- students are assigned a Director of Studies and a personal Tutor by their College;

- small group tutorials (supervisions) provided by Colleges, often with collaboration of Departments for the smaller and/or more specialised subjects;
- extensive staff contact in practical classes and, where applicable, field courses.

Criteria for Admission

It is essential for students to have obtained at least two science/maths GCE A2-levels (or the equivalent). Some subjects require or recommend particular A2-level prerequisites.

Typical offers from Colleges would be three GCE A2-levels at grade A*AA .

Mechanisms for evaluating and improving the quality of student learning support

Students have termly meetings with their College Tutor and Director of Studies to monitor and review their progress in the Tripos. This is facilitated by reports submitted to the Colleges by the student's supervisors on each course. Supervisors normally meet students on a weekly basis.

Each course in the Natural Sciences Tripos has a course management (or teaching) committee which regularly reviews the content of that course, student feedback and comments from examiners. Students have representation on these committees, either directly or through dedicated staff-student committees.

All Part II and Part III courses and some Part IB courses have external examiners, who are required to submit a report to the University. This is normally responded to by the appropriate Head of Department, or an appointed deputy. The report and response is scrutinised by the General Board's Education Committee.

The Committee of Management for the Natural Sciences Tripos, meets twice termly, and has student representation. It is responsible for the strategic direction along with routine matters of administration and assessment for the Tripos. The structure and philosophy of the Tripos, in the light of developments in the scientific world and other external changes that may affect the teaching of scientific subjects, is kept under review by the Committee of Management for the Natural Sciences Tripos. The Committee is informed by, and in turn informs, the Faculty Boards and comparable bodies who contribute to the teaching of Natural Sciences.

All Departments who teach in the Tripos are reviewed by the General Board once every six years.

Employment and Careers

The General Board considers that preparation for any specific branch of employment is not the main objective of most educational courses provided by the University, and takes the view that the requirement to include specific employers' needs and opinions in programme specifications would distort the aims and objectives of many Cambridge courses. Preparation for employment in general is provided in the opportunities for acquisition of relevant transferable skills outlined in programme specifications.

The Careers Service maintains links with relevant employers and takes into account employer needs and opinions in the services which it provides for students. Details of its services can be found at www.careers.cam.ac.uk/. The Careers Service also allocates a Careers Adviser to each College, Faculty and Department to act as a point of contact.

Structure of the Natural Sciences Tripos

The Natural Sciences Tripos is the framework within which most of the science is taught and examined in Cambridge. It is taught primarily by sixteen Departments and includes a wide range of physical and biological sciences, and the history and philosophy of science. Departments provide the structure for the Tripos and teaching in lectures and practical and examples classes; all students are members of a Cambridge College, which provides advice on the direction of studies and, in collaboration with the Departments, small-group teaching (supervisions).

The programme is only offered as a full-time course and normally lasts for three or four years, depending on the specialist subjects chosen. Students have a wide choice of subjects from their matriculation and therefore each student has an individual programme of courses leading to their degree. Further information on the Tripos and the individual courses can be found at www.cam.ac.uk/natscitripos/

The First Year (Part IA)

Students may enter Part IA of the Tripos if they have satisfied the criteria for admission specified for the Tripos, and have been admitted to a Cambridge College.

Students take four subjects: three experimental subjects and mathematics taken from the lists below. There is no restriction on the mathematical subject chosen, although a Director of Studies will offer firm advice on the most appropriate option, depending on the student's aspirations and previous knowledge.

| Experimental Subjects | Mathematics |
|---|---|
| Biology of Cells Chemistry Computer Science Evolution and Behaviour Geology Materials and Mineral Sciences Physics Physiology of Organisms | Elementary Mathematics for Biologists Mathematics Mathematical Biology |

Students are expected to attend, for each of the four subjects taken, three lectures, one supervision and an average of two to four hours of practical work during each week of the eight-week terms. College Directors of Studies give further advice on appropriate levels of extracurricular study.

The Second Year (Part IB)

Students may enter Part IB of the Tripos if they have successfully completed Part IA of the Tripos. Students may transfer from another Tripos, providing they have satisfied the criteria for admission specified for the Natural Sciences Tripos and have approval from their College Director of Studies. Many of the subjects offered at Part IB assume specific knowledge of particular Part IA courses.

Students take three subjects from the list given below. There are some restrictions on subject combinations, although there are well over 100 different combinations taken each year.

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| Chemistry A Chemistry B Geological Sciences A Geological Sciences B Materials Science and Metallurgy | Animal Biology Biochemistry and Molecular Biology Cell and Developmental Biology Ecology |
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| Mathematics Minerals Science Physics A Physics B History and Philosophy of Science | Experimental Psychology Neurobiology Pathology Pharmacology Physiology Plant and Microbial Sciences |
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Students are expected to attend, for each of the three subjects taken, three lectures, one supervision and up to six hours of practical work during each week of the eight-week terms. College Directors of Studies give further advice on appropriate levels of extracurricular study.

The Third Year (Part II)

Students may enter Part II of the Tripos if they have successfully completed Part IB of the Tripos. Students may transfer from another Tripos, providing they have satisfied the criteria for admission specified for the Natural Sciences Tripos and have approval from their College Director of Studies. Many of the subjects offered at Part II require specific knowledge of particular Part IB courses; in some cases, there may be a specific requirement to have studied these courses at Part IB. In addition, there is a restricted number of places on some Part II courses and students compete for a place based on agreed Departmental selection criteria and collaborative procedures.

Students usually choose to specialise in their third year from the subjects outlined below and therefore study one subject in depth.

| | |
|---|---|
| Astrophysics* Chemistry* Experimental and Theoretical Physics* Geological Sciences* Materials Science and Metallurgy* History and Philosophy of Science* | Biochemistry* Genetics Neuroscience Pathology Pharmacology Physiology, Development, & Neuroscience Physiology & Psychology Plant Sciences Psychology Zoology |
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** denotes subjects in which you can continue into a fourth year*

Alternatively, students may opt to take one of two more general courses, choosing two subjects from a wider range of topics. These courses allow students to take a course without a practical element.

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| Physical Sciences | Biological and Biomedical Sciences |
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Successful completion of the third year leads to the award of a B.A. degree.

The Fourth Year (Part III)

Students may enter Part III of the Tripos only if they have successfully completed the corresponding Part II course of the Tripos. Fourth year courses are offered in the following subjects:

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| Astrophysics Biochemistry Chemistry Experimental and Theoretical Physics |
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| Geological Sciences History and Philosophy of Science Materials Science and Metallurgy Systems Biology (from 2010-11) |
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Successful completion of the fourth year leads to the additional award of an M.Sci. degree. Progression to the fourth year is usually determined in two stages. At the end of the second year of study (Part IB), there are entry requirements for progressing to the M.Sci. programme; students must obtain a minimum standard of II.2 class, in their overall class and a II.2 standard in the Part IB subjects specified for progression onto Part II and III. In addition, students must also obtain a minimum standard of II.2 class at Part II of the Tripos.

Some subjects have different entry requirements and you should refer to <http://www.cam.ac.uk/about/natscitripos/ps/structure/part3.html> for further details.

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