



## FOUNDATION SCHOLARSHIP EXAMINATION 2018/19 – TR071 SCIENCE

The objective of the Scholarship examination in Science is to identify and reward undergraduate students having outstanding interest and ability in their chosen field. Such students should be able to demonstrate some degree of originality and flair, and not simply a high level of performance in basic coursework. Because the Scholarship examination in Science is taken by Senior Fresh students, it is based on the breadth of the Fresh Science course being followed by the student. Scholars are therefore outstanding in the field of general Science (or that division of it represented by the range of modules taken by the student in their Fresh years), and not in any specific discipline.

An application form and Foundation Scholarship regulations can be accessed on the Examinations and Timetables Office webpage:

<https://www.tcd.ie/academicregistry/exams/scholarship/>

Candidates are examined in two science subject areas incorporating such additional reading as may be required by individual heads of school or course directors. Candidates sit four papers of two hours duration. Recommendations for Scholarship will be based on the achievement of a first class result with first class marks in at least two of the four papers.

Candidates in TR071 choose two subjects from the following:

- BY: Biology (Molecular, Cellular and Systems Biology)
- BY: Biology (Evolution and Environment)
- CH: Chemistry
- GG: Geography
- GL: Geology
- MA: Mathematics (Science)
- PH: Physics

### Important Scholarship Dates

- 16th October 2018 – 30<sup>th</sup> October 2018 at 5pm - Submission of online applications
- 1<sup>st</sup> November 2018 – 7<sup>th</sup> December 2018 at 5pm - Submission of online withdrawal forms
- Monday 7<sup>th</sup> January 2019 to Friday 11<sup>th</sup> January 2019 - Foundation Scholarship Examinations. It may be necessary to hold some Foundation Scholarship examinations in the preceding week
- Trinity Monday, (29<sup>th</sup> April 2019) - Front Square Announcement of Election to Scholarship 2018



## BIOLOGY

**Contact:** Prof. John Rochford ([rchfordj@tcd.ie](mailto:rchfordj@tcd.ie))

As 'Biology' is a very broad subject area and Senior Fresh students may take up to 40 credits of 'Biology' modules (with over 60% of them opting for 'Biology' disciplines in their Sophister years), it is appropriate that 'Biology' should offer two separate options for Foundation Scholarship. These are as follows:

Biology 1 – Molecular, Cellular and Systems Biology

Biology 2 – Evolution, Biodiversity and the Environment

Both options will be examined by means of two, two-hour papers, with students answering two questions from four on each. Paper 1 (the 'general' paper) will be based on a theme, for which some special reading will be set as an introduction, while Paper 2 (the 'course' paper) will be based on material covered in the Fresh Biology modules, but examined at a level appropriate to Foundation Scholarship.

Full details of this year's themes and special readings will be made available shortly.

## CHEMISTRY

**Contact:** ([sfchem@tcd.ie](mailto:sfchem@tcd.ie))

There will be two two-hour examinations for chemistry in the Scholarship examinations. The subject examined will cover JF coursework and material covered in Semester 1 of Senior Fresh chemistry. Candidates will have to answer all four questions on each paper, one of which will be a general question, not based on coursework. All questions will have equal weighting.

The Foundation Scholarship examination in Chemistry examines the subject as covered in Junior Fresh year and in semester 1 of the senior Fresh year. The questions examine the candidate's ability to problem solve and to synthesize and integrate knowledge across the Fresh chemistry material.

Candidates must exhibit the ability to apply knowledge and informed critical thinking in all three disciplines of chemistry.

## GEOGRAPHY

**Contact:** Professor Philip Lawton ([Philip.lawton@tcd.ie](mailto:Philip.lawton@tcd.ie))

The Scholarship examination in Geography (Science and TSM) will consist of two two-hour examination papers. The first paper will examine the subjects covered in the GG22924 *Changing Environments* module. The second paper will deal with more general topics within the discipline of Geography.

The Foundation Scholarship examination papers in Geography are constructed in such a way as to test the depth and breadth of the candidates' overall understanding of the discipline.

The first two-hour paper is specifically designed to allow candidates to demonstrate a superior appreciation of the course-based material of the senior Fresh programme with an additional list of advanced readings being provided to candidates by the lecturers involved. In the second two-



hour paper candidates will have an opportunity to demonstrate their ability to synthesise knowledge and appraise, critically, the broader issues; thus allowing them to integrate disparate elements in the intellectual discourses within the discipline of Geography. In this regard, candidates are required to write two essays selected from an unseen list of broadly-themed topics within Geography which will change from year to year.

## GEOLOGY

**Contact:** Dr Emma Tomlinson [tomlinse@tcd.ie](mailto:tomlinse@tcd.ie)

Students are expected to provide clear and reasoned answers to questions from a reasonable choice on two 2-hour examination papers. The first paper will examine topics covered in the Junior Fresh module GL1101 and the Senior Fresh module GL22905. The second paper (the 'general' paper) will examine a range of geological topics.

The Scholarship Examination in Geology aims to identify exceptional students that demonstrate their ability to synthesise and cogently explain the significance of geological information drawn from both from course work but also from the literature covering the major topics that they have encountered since taking up Geology. Such students are also expected to show evidence of high-level independent study. Specific topics will not be set but the holistic approach to an understanding of the Dynamic Earth is encouraged. Questions set in the examination are broad-based, encompass a number of geological sub-disciplines, and, as such, allow for the identification of Scholarship-quality students.

## MATHEMATICS (SCIENCE)

**Contact:** Professor Vladimir Dotsenko ([vdots@maths.tcd.ie](mailto:vdots@maths.tcd.ie))

Students taking Mathematics as one of their Scholarship subjects will sit two papers in Mathematics, with a particular emphasis on problem solving. Paper 1 will be a general paper, testing the ability of candidates to solve unseen problems in mathematics and mathematical modelling, using in particular the skills developed in the modules MAU11S01 and MAU11S02 (same as MA1S11 and MA1S12 in 2017/18 nomenclature) of the Junior Fresh year. Paper 2 will consist of problems concerning the subject matter of the two Senior Fresh modules offered in the Michaelmas term (MAU22S01 Multivariable calculus for science and MAU22S03 Fourier analysis for science). The material from the Junior Fresh year (modules MAU11S01 and MAU11S02) is assumed as background to the Senior Fresh modules, but the problems on Paper 2 will be targeted at material covered in MAU22S01 and MAU22S03.

## PHYSICS

**Contact:** Professor M Hegner ([Martin.Hegner@tcd.ie](mailto:Martin.Hegner@tcd.ie))

The Foundation Scholarship examination in Physics seeks to identify students who are able to take the taught material as a starting point for in-depth analyses of set problems.

Both Junior Fresh and Michaelmas Term Senior Fresh topics will be examined through questions of a higher standard than those to be found at the Annual Examinations. There are two papers in Physics for all students, each of two hours duration. Each paper will consist of 3 sections of 2 questions each. Each paper will be graded by taking the highest scored question from each



section, plus the best mark from all remaining answered questions, for a total of 4 marked questions.

The first Physics paper will have one section on Thermodynamics, one section on Oscillations and one general Physics section. The second Physics paper will have one section on Electricity and Magnetism and, one section on Materials (all other physics students) and one general section. The general Physics section of each paper will consist of questions drawn from all material in the junior and the first semester of Senior Fresh years.

Theoretical Physics students should note that the Junior Fresh topic Special Relativity will not be examined but that their knowledge of classical mechanics may be examined in the general physics section.

**Science Course Office  
September 18**

Note: The information provided in this leaflet is accurate at time of preparation. Any revisions will be notified to students via e-mail and the Science Course Office Website:

<https://www.tcd.ie/Science/>