



FOUNDATION SCHOLARSHIP EXAMINATION 2016/17 – 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 Freshman students, it is based on the breadth of the Freshman 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 Freshman years), and not in any specific discipline.

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

<http://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

- Tuesday 1 November 2016 - first day for submission of applications
- Tuesday 15 November 2016 (by 5.00 pm) - last day for submission of applications
- Monday 9th January 2017 to Friday 13th January 2017 - Foundation Scholarship Examinations. It may be necessary to hold some Foundation Scholarship examinations in the preceding week
- Monday 6th February 2017 - Science Foundation Scholarship 2017 Examiners meeting
- Trinity Monday, (10th April 2017) Front Square Announcement of Election to Scholarship 2017



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Biology

Contact: Prof. John Rochford rchfordj@tcd.ie

As 'Biology' is a very broad subject area and Senior Freshman 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 Freshman 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

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 SF chemistry. Candidates will have to answer four questions on each paper, one of which will be a general question, not based on coursework, and will be compulsory. All questions will have equal weighting.

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

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

GEOGRAPHY

Contact: Professor Martin Sokol sokolm@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 GG2024 *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 freshman programme with an additional list of advanced readings being provided to candidates by the lecturers involved. In the second



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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

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 JF module GL1101 and the SF module GL2205. 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 Paschalis Karageorgis pete@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 MA1S11 and MA1S12 of the Junior Freshman year. Paper 2 will consist of problems concerning the subject matter of the two Senior Freshman modules offered in the Michaelmas term (MA22S1 Multivariable calculus for science and MA22S3 Fourier analysis for science). The material from the Junior Freshman year (modules MA1S11 and MA1S12) is assumed as background to the Senior Freshman modules, but the problems on Paper 2 will be targeted at material covered in MA22S1 and MA22S3.

PHYSICS

Contact: Professor H. Zhang hozhang@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 Freshman and Michaelmas Term Senior Freshman 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, one section on Chaos (Theoretical Physics students only) or Special Relativity



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(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 Freshman years.

Theoretical Physics students should note that the Junior Freshman 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 2017**

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/>