



TR061: Chemical Sciences

Foundation Scholarship Examination 2020/21 – Information for Scholarship Candidates

As described in the College Calendar:

“The objective of the foundation scholarship examination is to identify students who, at a level of evaluation appropriate to the Senior Freshman year, can consistently demonstrate exceptional knowledge and understanding of their subjects. The examination requires candidates to demonstrate: skill in synthesising and integrating knowledge across the full range of the set examination materials; rigorous and informed critical thought; and, in appropriate disciplines, a highly-developed ability to solve problems and apply knowledge. “

The objective of the Scholarship examination in Science is to identify and reward undergraduate students with outstanding knowledge and ability in each of the four Science degree programmes (TR060, Biological and Biomedical Sciences; TR061, Chemical Sciences; TR062, Geography and Geoscience; TR063, Physical Sciences). Such students should demonstrate an understanding and knowledge of their chosen field with some degree of originality and flair, and not simply a high level of performance in basic coursework. The Scholarship examination is taken by Senior Freshman students in each degree and is based on the designated course work presented in the Junior Freshman and the first semester of the Senior Freshman years. In addition, students might also be examined on designated non-coursework material, which is specific for each degree.

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 the subject area of each degree incorporating such additional reading as is required by the Directors of each degree. Recommendations for Scholarship will be based on the achievement of an overall first class result with first class marks in at least two of the three or four papers examined in any of the degrees (students across College will sit either 3 or 4 papers, depending on their degree) and a mark of 65% or over in each paper.



TR061: Chemical Sciences

Contact: Prof. Eoin Scanlan and Dr. Noelle Scully (sfchem@tcd.ie)

TR061 candidates presenting for scholarship examinations will sit three examination papers. Two in chemistry and a third paper chosen from one of the following: Biology Paper 2 (based on material covered in **Senior Freshman module BYU22201**: *from* Molecules to Cells, 3hrs in duration, students answer three questions from six.), Maths Paper 1, Maths Paper 2, Physics Paper 1, Physics Paper 2 (details below).

Both chemistry examinations will be three hours in duration. The subject examined will cover JF coursework and material covered in Semester 1 of Senior Freshman chemistry. Candidates will have to answer all five questions on each paper, two of which will be general questions, integrative in nature and not necessarily based on coursework. 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.

MATHEMATICS for Physical Sciences (TR063), Chemical Sciences (TR061)

Contact: Professor Paschalis Karageorgis (karageop@tcd.ie)

Mathematics examinations are available to students in Physical Sciences (TR063) and to students in Chemical Sciences (TR061). Two examination papers are set each of 2 hrs duration. Students in Physical Sciences take both papers, students in Chemical Sciences take one paper.

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 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 (MAU22S01 Multivariable calculus for science and MAU22S03 Fourier analysis for science). The material from the Junior Freshman year (modules MAU11S01 and MAU11S02) is assumed as background to the Senior Freshman modules, but the problems on Paper 2 will be targeted at material covered in MAU22S01 and MAU22S03.



TR063: Physical Sciences

Contact: Prof. D. McCloskey (mcclskd@tcd.ie) and Prof. C. McGuinness (cmcguin@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.

Students sitting Foundation Scholarship examinations in the Physical Sciences (TR063) Degree must take Mathematics examinations in addition to Physics as their Scholarship subjects and will sit two papers in Mathematics, with a particular emphasis on problem solving. The Mathematics examinations are detailed later.

For the Physics papers, 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 end-of-semester module Examinations. There are two papers in Physics for all students, each of duration two hours. 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 Materials and one general Physics section. The general Physics section of each paper will consist of questions drawn from all material in the Junior Freshman year and the first semester of Senior Freshman years.

Science Course Office

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/>