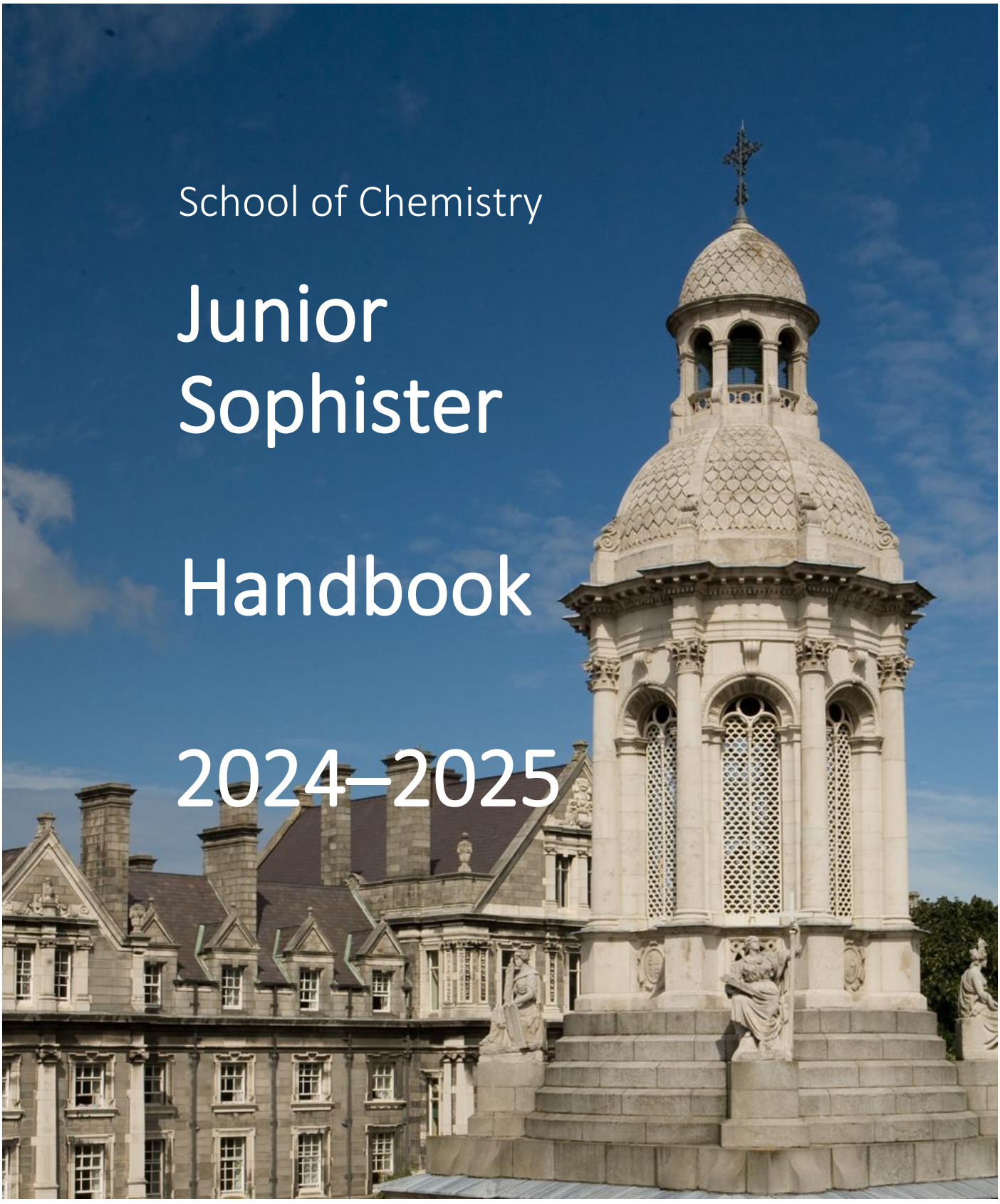

School of Chemistry

Junior Sophister Handbook 2024–2025

Contents

1. General Course Information

Introduction

Together with the Associate Dean of Undergraduate Science Education I, as Course Director of the Chemical Sciences, wish all of the soon-to-be Sophister students well in the final two years of their degree. This handbook reflects the structure of the Junior Sophister year in all five of the Moderatorships available within the Chemical Sciences course. These five are the **Chemistry** Moderatorship, the **Medicinal Chemistry** Moderatorship, the **Chemistry with Molecular Modelling** Moderatorship, the **Chemistry with Biosciences** Moderatorship and the **Nanoscience** Moderatorship. The course structures, core modules, practical elements, progression, capstone research projects, and the choices available (Junior Sophister Open, Junior Sophister Trinity Elective) are listed in this handbook.

Specifically, there are opportunities during the final two years of each Moderatorship to tailor your degree through your choices within the Junior Sophister year (by your selection of Junior Sophister Open modules and Trinity Electives); your preference for your Senior Sophister capstone project, and your selection from among the Senior Sophister Optional modules. Rest assured that whatever your pathway and whatever the Moderatorship ultimately chosen, each of our chemistry degrees offers you a wide range of transferable skills that will be of high value in research, industry or business.

Best wishes to all,

Prof. Valeria Nicolosi
Director of Teaching and Learning, Undergraduate
School of Chemistry

Junior Sophister Website:

Junior Sophister - School of Chemistry - Trinity College Dublin (tcd.ie)

Emergency Procedure

In the event of an emergency, dial Security Services on extension **1999**.

Security Services provide a 24-hour service to the college community, 365 days a year. They are the liaison to the Fire, Garda and Ambulance services and all staff and students are advised to always telephone extension 1999 (+353 1 896 1999) in case of an emergency.

Should you require any emergency or rescue services on campus, you must contact Security Services. This includes chemical spills, personal injury or first-aid assistance. It is recommended that all students save at least one ICE (in case of emergency) phone number in their mobile phones.

Contact Details

Staff Name	Role/Title	E-mail	Phone
Prof. Graeme Watson	CMM Director and Head of School	graeme.w.watson@tcd.ie	896 1357/1423
Prof. Valeria Nicolosi	Director of Teaching and Learning (DTLUG)	nicolov@tcd.ie	896 4408
Prof. Mike Southern	MedChem Director and Associate DTLUG	southerj@tcd.ie	896 3411
Prof. Peter Dunne	JS Year Coordinator	p.w.dunne@tcd.ie	896 4449
Prof. Joanna McGouran	Chemistry with Biosciences Director	jmcgoura@tcd.ie	896 1422
Prof. Matthias Möbius	Nanoscience Director	mobiusm@tcd.ie	896 1055
Dr. Sinéad Boyce	School Manager	sboyce@tcd.ie	896 4587
Ms. AnneMarie Farrell	Administrative Officer	farrea25@tcd.ie	896 1726
Mr. Ben Power	Executive Officer	powerbe@tcd.ie	896 2040
Ms. Wen Liu	Global Officer	liuw9@tcd.ie	

Key Locations

Formal chemistry teaching in TCD commenced in August 1711 as part of the new School of Medicine. The Cocker laboratories provide facilities for the teaching of preparative inorganic and organic chemistry. The Sami Nasr Institute for Advanced Materials (SNIAM) building provides ca. 1500 m^2 of accommodation for the School of Chemistry. This includes a Physical Chemistry teaching laboratory and six research laboratories that house ca. 40 researchers. This institute also houses the School of Physics. Computational Chemistry research is housed in the Lloyd Institute on a multidisciplinary computational-science floor comprising researchers from

Mathematics, Physics, Chemistry and High Performance Computing. In addition, chemists play an important role in interdisciplinary research taking place in two of TCD's newer research institutes: (i) The Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN) and (ii) the Trinity Biomedical Sciences Institute (TBSI).

The majority of chemistry lectures will be held in the School of Chemistry building in either the Large Lecture Theatre (CHLLT) or the Science Lecture Theatre (CHSCLT). Additional classes may be held in the Senior Sophister Room (SSR) or New Seminar Room (NSR), also in the Chemistry building.

Practical laboratory sessions will take place in either the Cocker Laboratory in the Hamilton Buildings, East End 4-5 (opposite the Science Course Office), or the Physical Chemistry Laboratory in the SNIAM building.

Workshops may also be held online through Blackboard Collaborate or similar.

All venues will be clearly indicated on your my.tcd.ie timetable.

Room	**MyTCD Code**	**Location**
School Office	-	Chemistry Building (First Floor)
Large Lecture Theatre	CHLLT	Chemistry Building (Ground Floor)
Science Lecture Theatre	CHSCLT	Chemistry Building (First Floor)
New Seminar Room	CHEM_SEM	Chemistry Building (First Floor)
Senior Sophister Room	CHEM_SS_RM	Chemistry Building (First Floor extension)
Computer Lab	CHEMCOMP	Chemistry Building (Second Floor)
Cocker Lab	CHADLAB/East End 4	Hamilton Buildings, East End 4-5
Physical Chemistry Lab	TEACHLAB	SNIAM Building (Second Floor)
Nanoscience Lab	SNIAM_LAB4	SNIAM Building (Ground Floor

References/Sources:

Interactive College Map

Blackboard

Academic Registry

Key Dates

***JS Safety Lecture and Workshop**	9 and 11 September 2024
Study/Review Week Semester 1:	Monday 21 October to Friday 25 October 2024
Christmas Period - College closed:	24 December 2022 to 1 January 2024 inclusive
Study/Review Week Semester 2:	Monday 3 March to Friday 7 March 2024
Formal Assessment weeks	
Semester 1 examinations:	Monday 9 to Friday 13 December 2024
Semester 2 examinations:	Monday 21 April to Friday 25 April 2025

*Attendance at the safety workshop is compulsory for all JS students as advised previously.

Reference/Source:

Academic Year Structure

Timetable

Your timetable is available through my.tcd.ie.

Reference/Source:

my.tcd.ie

2. SCHOLARSHIPS AND PRIZES

Prizes, Medals and Other Scholarships

The Mary Carson Book Prize in Chemistry

This prize was established in 2023 in memory of Dr Mary Carson, who was one of the first female academics in the School of Chemistry and had a life-long involvement with the Trinity second-hand book sale. The prize is awarded annually on the recommendation of the Head of the School of Chemistry to the Junior Sophister chemical sciences student with the highest combined mark in chemistry exams. Value, €500.

Dr. George A. Lonergan Prize

This prize is awarded annually to the student who gives the best performance in the Junior Sophister year, provided that sufficient merit is shown and the student has not been awarded another JS prize. Value, €381.

Brian McMurry Prize

This prize was established in 2009 by the friends of Dr Brian McMurry, Professor of Organic Chemistry, on his retirement. It is awarded each year to the Junior Sophister candidate from outside the European Union who is a student of the natural sciences and who obtains the highest overall marks in the annual examinations. Value, €130.

3. ACADEMIC WRITING

Academic Integrity and Referencing Guide

In Trinity College Dublin, we commit ourselves as staff and students to acting responsibly and ethically, embracing integrity in all our actions and interactions as members of the College community. Understanding that integrity requires honesty, transparency and accountability, we agree to:

- Strive to do what we say we will, ensuring that we are aware of our commitments and responsibilities in order to fulfil them, and abiding by College and other relevant policies and the highest standards of conduct.
- Give credit where credit is due, recognizing and acknowledging the contributions and achievements of others in scholarship, teaching, research and service.
- Tell the truth, as a community and as individuals, speaking out and listening even when it is difficult, naming problems and honestly acknowledging mistakes.
- Hold ourselves and others to account for the things for which we are each responsible.
- Use resources for the purposes for which they are intended and be above reproach in financial dealings.
- Deal fairly, consistently and transparently with others.

It is clearly understood that all members of the academic community use and build on the work and ideas of others. However, it is essential that we do so with integrity, in an open and explicit manner, and with due acknowledgement.

Any action or attempted action that undermines academic integrity and may result in an unfair academic advantage or disadvantage for any member of the academic community or wider society may be considered as academic misconduct. Examples of academic misconduct include, but are not limited to:

(i) plagiarism - presenting work/ideas taken from other sources without proper acknowledgement. Submitting work as one's own for assessment or examination, which has been done in whole or in part by someone else, or submitting work which has been created using artificial intelligence tools, where this has not been expressly permitted;

(ii) self-plagiarism - recycling or borrowing content from the author's own previous submitted work without citation and submitting it either for an assignment or an examination;

(iii) collusion - undisclosed collaboration of two or more people on an assignment or task, or examination, which is supposed to be completed individually;

(iv) falsification/fabrication;

(v) exam cheating - action or behaviour that violates examination rules in an attempt to give one learner an unfair advantage over another;

(vi) fraud/impersonation - actions that are intended to deceive for unfair advantage by violating academic regulations. Using intentional deception to gain academic credit;

(vii) contract cheating - form of academic misconduct in which a person uses an undeclared and/or unauthorised third party to assist them to produce work for academic credit or progression, whether or not payment or other favour is involved. Contract cheating is any behaviour whereby a learner arranges to have another person or entity ('the provider') complete (in whole or in part) any assessment (e.g. exam, test, quiz, assignment, paper, project, problems) for the learner. If the provider is also a student, both students are in violation.

Further examples of the above available at www.tcd.ie/teaching-learning/academic-integrity.

TCD Guidelines on Academic Integrity can be found at this link:

general-regulations-and-information.pdf (tcd.ie)

When submitting work for assessment, students will need to state and sign a declaration that they and have read and understood College rules on plagiarism *via* use of the Coversheet Declaration listed below.

Reference/Source

Calendar Part II, B: General Regulations & Information, 'Academic Integrity'

Statement of Principles on Integrity

Academic Integrity Policy (currently in development)

Library Guides - Academic Integrity

Coversheet Declaration

4. TEACHING AND LEARNING

4.1 Programme Architecture

The School of Chemistry currently offers five QQI-NFQ Level-8 moderatorships, namely Chemistry (Chem), Medicinal Chemistry (MedChem), Chemistry with Molecular Modelling (CMM), Chemistry with Biosciences (CB), and Nanoscience (N), which is a shared course between the Schools of Physics and Chemistry. Incoming JF students enter through a common pathway, TR061, Chemical Sciences and select their moderatorship in their Senior Fresh year.

Staff, Research and Facilities

The School currently has 25 academic staff and 14 technical staff. The School has an active research programme, with approximately 100 postgraduate students and postdoctoral researchers. They study a wide range of chemistry subjects in fields such as organic, inorganic, organometallic, physical, theoretical, medicinal, analytical, material, polymer, environmental, and supramolecular chemistry. Research income is earned from national, international and commercial sources and the School has held grants from all relevant research programmes funded by the EU.

The College also fosters an interdisciplinary approach to research, with members of the School having strong links with colleagues in the physical, medical, technological and biological sciences both within College, nationally and internationally.

The School is well equipped for its research activities, having Bruker 600 and 400 MHz NMR spectrometers and access to an Agilent 400 MHz high-field multi-nuclear NMR spectrometer, FTIR, dispersive IR and UV-Vis spectrometers, high performance liquid chromatography (HPLC) and gas chromatography (GC) equipment, a Bruker SMART Apex Kappa Duo, Bruker D8 Quest ECO single crystal and a Bruker D2 Phaser powder x-ray diffractometers, a Micromass LCTTM (TOF) mass spectrometer, thermogravimetric analysis and differential scanning calorimetry equipment, dynamic light scattering, several spectrofluorimeters for steady-state and time-resolved fluorescence measurements, circular and linear dichroism, and a large range of wave generators and potentiostats for cyclic voltammetry.

Lectures

Lectures should begin on the hour and end 50 minutes later. Timetables will be published through the portal my.tcd.ie and should be checked regularly for changes to the original schedule. Module descriptors and learning outcomes for your modules are available on Blackboard. Attendance at lectures may be recorded. Lecture notes/quizzes will be provided through Blackboard (https://tcd.blackboard.com/webapps/login/) and details related to fees, assessment, exam timetables etc. can be found on the Academic Registry's website at https://www.tcd.ie/academicregistry/.

Description of the Year

JS modules are delivered in both semester 1 and semester 2 and they are assessed via a combination of in-course assessment, practical work (with associated reports) and end of semester summative assessments in the form of written examinations. All written examinations are carried out during the assessment week at the end of the corresponding semester. Students failing a JS module are reassessed during the reassessment period or in the next assessment period for the module in the case of deferred exams. **NB: Reassessment marks will be capped at 60%.**

All JS modules build upon the fundamental principles covered in the Fresh years and include more specialised topics relevant to the moderatorships. The students that perform best during their JS and subsequent years have an excellent understanding of the chemistry from the first two years. In the JS year, students must take a total of 40 ECTS Core Credits in chemistry; to complete their year requirement of 60 ECTS, they must select 20 ECTS from Open Modules and Trinity Electives (with a minimum of 5 ECTS TE and a maximum of 10 ECTS TE). Note that students are required to undertake a Trinity Elective in the first semester with the exception of Nanoscience students who must complete their Trinity Elective in the second semester.

Laboratory practical work is assessed in-course. **Attendance** at chemistry practical classes is recorded and compulsory for students. **You must attend and submit more than two thirds of the required coursework for any module**. Unauthorized late submissions of coursework will result in a 10% reduction in marks for the first 24-hour delay and a 5% reduction per working day thereafter. At the end of teaching term students who have not satisfied these regulations may be reported as non-satisfactory for that term. Students whose attendance is reported as non-satisfactory may be refused permission to take their semester one or semester two examinations and may be required to repeat the year.

Non-submitted/failed reports will have to be reassessed. They will all have to be submitted during the summer and the student will have to undergo an in-depth *viva voce* examination for each failed module.

Mandatory Laboratory Safety Workshop: In order to reinforce and extend a student's laboratory skills in Chemistry, rising Junior Sophister students **are required** to attend a workshop on Safety, which is held at the beginning of Semester 1. Attendance at all workshops **is compulsory**.

Examinations

An overall pass mark of 40% is required to proceed to the Senior Sophister year. Students who successfully complete their JS year may opt to leave with a level-7 ordinary B.A. (B.A.(Ord.)). Full details of the Junior Sophister Science examination regulations may be found in the Appendices of the TR061 Sophister Course Booklet. Past examination papers are available from the Academic Registry's website (https://www.tcd.ie/academicregistry/exams/past-papers/annual/) and can be used to

familiarize yourself with the structure of examination papers. The JS Chemistry mark contributes to **30%** of the final Moderatorship degree mark.

Feedback and Evaluation

The courses offered by the School benefit from student feedback. Rather than waiting until the end of a module to request online feedback, the School of Chemistry has instituted a Sophister Liaison Committee (SLC). Committee members comprise the DTLUG/Associate DTLUG, the School Convenor, JS and SS class reps, and Heads of Discipline or their representatives and the meetings are minuted. Class reps should collate feedback from their fellow students to bring to the meetings, which takes place at least once per semester.

Moderatorship Courses and Quotas

To be qualified for a Moderatorship, students must have successfully completed both Fresh years and must have taken the stated prerequisite modules for any Moderatorship for which they wish to be considered. All students in Chemical Sciences who have completed both Fresh years are eligible to proceed into the **Chemistry** or the **Chemistry with Molecular Modelling** Moderatorships. The three Moderatorships with a prerequisite are **Nanoscience** (where a student must have taken all of the 10-credit JF/SF Physics modules), **Chemistry with Biosciences** and **Medicinal Chemistry** (where a student must have taken the required Biology modules).

While every effort will be made to give due notice of major changes in the quotas, the Chemical Sciences Course Director reserves the right to alter prerequisites and quotas, if necessary. In the case of the Nanoscience Moderatorship this will be in conjunction and in consultation with the Physical Sciences Course Director and the Nanoscience Moderatorship Course Director.

Moderatorship	**Quotas**
Chemistry	30
Medicinal Chemistry	30
Chemistry with Molecular Modelling	8
Nanoscience	10 + 6*
Chemistry with Biosciences	10

***Note regarding Nanoscience quota.** Nanoscience is a shared course between the Schools of Physics and Chemistry and is accessible through both Physical Sciences (TR063) and Chemical Sciences (TR061) for students with the appropriate 120 credits of Fresh modules in Physics, Chemistry and Mathematics. The 5 highest ranked students from both Physical Sciences and Chemical Sciences (10 in total) are allocated places in the Nanoscience Moderatorship. Six additional places are available to the highest ranked qualified students from either Physical or Chemical Sciences who have not already been allocated a place in the Moderatorship.

TR061: Moderatorships and Approved Module Choice Diagram

In the Junior and Senior Fresh years TR061 students complete a course of study that will qualify them to compete for a place in one of the following Moderatorships after the Senior Freshman year:

- Chemistry (C)
- Chemistry with Biosciences (CB)
- Chemistry with Molecular Modelling (CMM)
- Medicinal Chemistry (MC)
- Nanoscience N).

The curriculum in the five Moderatorships is tailored to offer a general chemistry degree (C), a chemistry degree with an emphasis on molecular modelling (CMM), a degree focusing on the synthesis and applications of small drugs for medicinal purposes (MedChem), a degree with emphasis on the chemistry and physics of advanced materials and nanomaterials (N), and a degree spanning chemistry and the biosciences (CB). Importantly, students should ensure that module choices over JF and SF years fulfil the requisites to apply for a place in their preferred Moderatorship(s). The credits dedicated to each discipline depend on module pattern choice and are outlined below:

Pattern SF.1 fulfils requisites for Moderatorships in C, CMM, MC, CB	**Patterns SF.2-3** fulfils requisites for Moderatorships in C, CMM, MC, CB	**Patterns SF.4** fulfils requisites for Moderatorships in C, CMM, MC, CB	**Pattern SF.5** fulfils requisites for Moderatorships in C, CMM, N
30 ECTS Chemistry	25 ECTS Chemistry	20 ECTS Chemistry	20 ECTS Chemistry
5 ECTS Maths	10 ECTS Maths	15 ECTS Maths	15 ECTS Maths
5 ECTS History, Philosophy and Ethics of Science	5 ECTS History, Philosophy and Ethics of Science	5 ECTS History, Philosophy and Ethics of Science	5 ECTS History, Philosophy and Ethics of Science
20 ECTS Biology	20 ECTS Biology	20 ECTS Biology	20 ECTS Physics

The Table below summarises which SF module patterns fulfil requisites to apply for each of the five Moderatorships.

Chemistry	Chemistry with Molecular Modelling	Medicinal Chemistry	Chemistry with Biosciences	Nanoscience
All 5 patterns	All 5 patterns	Patterns SF.1-4	Patterns SF.1-4	Pattern SF.5 only

The JS year consists of lectures, tutorials and practicals delivered in modules, as listed below. Within the Junior Sophister year in Chemistry there are 40 credits of Core modules, with the remaining 20 credits comprising either Open or Elective modules. **All students, with the exception of Nanoscience, are required to take a Trinity Elective in the first semester; Nanoscience students take a TE in the second semester.**

Mandatory Laboratory Safety Workshop: In order to reinforce and extend a student's laboratory skills in Chemistry, rising Junior Sophister students **are required** to attend a workshop on Safety, which is held at the beginning of Semester 1. Attendance at all workshops **is compulsory**.

Trinity Electives

(https://www.tcd.ie/trinity-electives/)

Trinity Electives are a unique feature of your Trinity Education. They are stand-alone, College-wide 5-credit modules. They cover a broad range of topics in the arts, humanities, sciences, health and social science, and technology. They are designed to allow students to study topics outside of their core discipline and thus to develop breadth within their education. Chemical Sciences students take a minimum of one and a maximum of two Trinity Electives in the Junior Sophister year. Depending on your moderatorship, you will choose a combination of Trinity Electives and Open Modules as described in this handbook.

Choosing your Trinity Elective

The choice of Trinity Elective is student-driven. Almost all Trinity Electives are open to all students, with exceptions outlined on the Trinity Electives webpage (e.g., From Planets to the Cosmos is not available to TR063 Physical Sciences students, for obvious reasons).

Selection will be made through online enrolment, which will open between 24 July and 7 August 2024, after publication of results and allocation of moderatorships. You will be asked to list your choice(s) of Trinity Elective in order of preference. Places are allocated according to a computer algorithm and are based on student preference and places available in the Trinity Elective. Exam results are not factored into this algorithm.

The Trinity Electives website provides full details of each of the Trinity Electives. A list of the Trinity Electives can be found at https://www.tcd.ie/trinity-electives/

You will need to think carefully about your choice of Trinity Elective as taking an elective in Semester 2 will affect the Open Modules that you can take – refer carefully to the tables in this handbook.

May: Results are published.

June: Moderatorships are allocated.

Students apply for Trinity Electives through an online portal on the Trinity Electives website (https://www.tcd.ie/trinity-electives/apply/). Trinity Electives are allocated by computer algorithm.

Students are informed of their Trinity Elective allocation.

Following this process, students will select their Open Modules.

Junior Sophister Examination Information

Modules are assessed by continuous assessment and/or by examination. The Junior Sophister year carries a total of 60 credits. The distribution of marks between papers and practical work at the Sophister examinations can be found in the module descriptions. Junior Sophister Practicals will be assessed by continuous assessment. Attendance is mandatory in weeks 30-31 as detailed in the student timetable. Details of practical reporting requirements, related deadlines and the assessment process will be provided in the lab manual. The distribution of marks between papers and practical work at the Sophister examinations can be found in the module descriptions.

Calculation of Moderatorship results

The final moderatorship results are calculated as a weighted average of the overall result for the Junior and Senior Sophister examination results, as follows:

Junior Sophister 30%, Senior Sophister 70%.

Reassessment Regulations

Reassessment is available in all years.

The right to reassessment of a module will be automatic for those students who receive a fail grade.

Reassessment marks will be capped at 60% for all TR061 modules, including those offered through Physics and Biology.

Students may not present for reassessment in a module they have passed.

Repeat-Year regulations

Students who fail to satisfy the requirements of their year at the Reassessment session are required to repeat the year in full (i.e. all modules and all assessment components). Students are permitted to repeat any year of an undergraduate programme subject to not repeating the same year more than once and not repeating more than two academic years within a degree course, except by special permission of the University Council (see Calendar, https://www.tcd.ie/calendar/undergraduate-studies/general-regulations-and-information.pdf).
The option to repeat a year in an 'off-books' basis will be at the discretion of the Senior Lecturer.

Seminars and Special Lectures

You are expected to attend the School's research seminars, which are held at noon on Thursdays during both semesters. Talks will be advertised on the School website at http://chemistry.tcd.ie/. During the year, lectures on various topics will be arranged by the School, the Werner Chemical Society, the Royal Society of Chemistry and/or the Institute of Chemistry of Ireland. You will find many of them interesting and valuable. Attendance at these lectures is recorded.

Preparation for the Senior Sophister Year

JS year is the time to investigate your options regarding where to carry out your final-year capstone project. Semester 1 of the Senior Sophister year is spent working full-time on a research project in TCD, or at a university abroad. The School encourages interested students to go abroad if they so wish. Those achieving a grade of II-1 or higher in their JS year will have automatic approval to go abroad but for those with lower grades, the request will be reviewed on a case-by-case basis. Arrangements for projects abroad are made in the JS year and will be coordinated by Prof. Richard Hobbs.

4.2 Course Structures

4.1.1 Junior Sophister Chemistry/MedChem/CMM Course Structure Diagram

Chemistry
Course Advisor: Prof. Peter Dunne
The Chemistry moderatorship affords access to a wide range of careers in industry, academia and the professions. By choice of practical project and of lecture options in the final year, a student may specialise in Organic, Physical or Inorganic Chemistry.

Chemistry with Molecular Modelling
Course Advisor: Prof Graeme Watson
A degree in Chemistry with Molecular Modelling allows access to a wide range of careers in industry, academia and the professions.

Medicinal Chemistry
Course Advisor: Prof. John Southern
Medicinal Chemistry is the area of chemistry that bridges chemistry, pharmacy and medicine and specialises in drug discovery, development and translational chemistry. The specialisation really begins in the Sophister years, building upon the fundamental principles covered in the Freshman years. From a chemistry perspective the focus is on both Organic and Medicinal Chemistry. Graduates will receive a degree in Medicinal Chemistry, which affords access to a wide range of careers in industry, academia and the professions.

For all three Moderatorships, the JS year consists of lectures, tutorials and practicals delivered in modules, as listed below. Within the Junior Sophister year in Chemistry there are 40 credits of Core modules, with the remaining 20 credits comprising either Open or Trinity Elective modules. **All students except Nanoscience students are required to take a Trinity Elective in the first semester. Nanoscience students must complete their Trinity Elective in the second semester**

Mandatory Courses: In order to reinforce and extend a student's laboratory skills in Chemistry, rising Junior Sophister students **are required** to attend a lecture and workshop on Safety, which is held in the first teaching week of Michaelmas Term. Attendance at all workshops **is compulsory**.

Assessment and Examination Procedures:

The lecture material will be examined in module examination papers taken during the examination periods. Practical work is assessed in-course. The JS Chemistry mark will contribute 30% of the final degree mark.

The Junior Sophister course structure is diagrammatically illustrated below:

<table>
<tr><th colspan="4">Junior Sophister TR061 - Chem/CMM/MedChem</th></tr>
<tr><td colspan="4">40 ECTS Core</td></tr>
<tr><td colspan="2">Semester 1</td><td colspan="2">Semester 2</td></tr>
<tr><td>CHU33209 (Org Lab; 5 ECTS)</td><td>CHU33409 (ACM Workshop; 5 ECTS)</td><td>CHU33109 (Inorg Lab; 5 ECTS)</td><td>CHU33309 (PhysChem Lab; 5 ECTS)</td></tr>
<tr><td>CHU33405 (5 ECTS) Interdisciplinary Methods</td><td>CHU33207 (5 ECTS) Organic Chemistry</td><td>CHU33107 (5 ECTS) Inorganic Chemistry</td><td></td></tr>
<tr><td>CHU33303 (5 ECTS) Physical Chemistry</td><td></td><td></td><td></td></tr>
<tr><td colspan="4">20 ECTS Open Modules/Elective</td></tr>
<tr><td colspan="2">Elective 1 (5 ECTS)
Mandatory</td><td colspan="2">Elective 2 (5 ECTS)
Optional</td></tr>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">Open Modules (5 ECTS each)</td></tr>
<tr><td colspan="2">Organic*/Inorganic/Physical**/MedChem*** Options
* Organic option is compulsory for MedChem
**Physical option is compulsory for CMM
***Only available as an option for the MedChem and ChemBio moderatorship</td></tr>
</table>

Details for each individual moderatorship and a brief descriptor for each module are outlined in the next section.

4.1.2 Chemistry with Biosciences

Course Advisor: Prof. Joanna McGouran

Chemistry with Biosciences is the area of chemistry that bridges chemistry, biochemistry, immunology and biosciences while maintaining a solid foundation in chemistry. The specialisation really begins in the Sophister years, expanding upon the biological topics covered in the Freshman years alongside core and optional chemistry modules. Graduates will receive a degree in Chemistry with Biosciences, which affords access to a wide range of careers in industry, academia and the professions. This degree is particularly suited to interdisciplinary careers such as medical writing, patent law and biopharma research and manufacturing.

The JS year consists of lectures, tutorials and practical laboratory sessions delivered in modules, as listed below. Within the Junior Sophister year in Chemistry there are 40 credits of Core Chemistry modules, 15 credits of Core Bioscience modules with the remaining 10 credits being a choice between CHU33150, CHU33205 and CHU33442. **All students are required to take a Trinity Elective in the first semester.**

Mandatory Courses: In order to reinforce and extend a student's laboratory skills in Chemistry, rising Junior Sophister students **are required** to attend a day-long workshop on Safety, which is held in the first teaching week of Michaelmas Term. Attendance at all workshops **is compulsory**.

Assessment and Examination Procedures:
The lecture material will be examined in module examination papers taken during the examination periods. Practical work is assessed in-course. The JS Chemistry mark will contribute towards 30% of the final degree mark.

The Junior Sophister course structure is diagrammatically illustrated below:

Junior Sophister TR061 – Chemistry with Biosciences			
40 ECTS Core			
Semester 1		**Semester 2**	
CHU33209 (Org Lab; 5 ECTS)	CHU33409 (ACM Workshop; 5 ECTS)	CHU33509 (Inorg & Phys Labs; 5 ECTS)	BYU33102 (5 ECTS) From Organisms to Ecosystems
CHU33403 (5ECTS) Interdisciplinary Methods	CHU33207 (5 ECTS) Organic Chemistry I	CHU33107 (5 ECTS) Inorganic Chemistry	
CHU33303 (5ECTS) Physical Chemistry		BYU22207 (5ECTS) Genomes, Disease and Diversity Lect & Lab	BYU22206 (5ECTS) Microbes, Immune Systems & their Interaction Lect & Lab
5 ECTS Electives/Options		**5 ECTS Open**	
Elective 1		Chem option from JS*	

*Option availability subject to timetabling

4.1.3 Nanoscience

Course Advisor: Prof. Matthias Möbius

Nanoscience is a moderatorship taught jointly by the Schools of Physics and Chemistry. Building on the foundation courses taken in the Fresh years, students follow in-depth courses across the spectrum of modern physics, physical chemistry, materials science and nanoscience while reflecting the strength of Trinity's research expertise in these areas.

The Junior Sophister year consists of lectures, tutorials and practicals delivered in modules, as listed below. Within the Junior Sophister year in Nanoscience there are 40 credits of Core modules, with the remaining 20 credits comprising either Open or Elective modules. **All Nanoscience students are required to take a Trinity Elective in the second semester of their Junior Sophister year.** Students receive training in communication skills within the practical modules.

Safety:
To reinforce and extend laboratory skills rising Junior Sophister students are required to attend a Chemical and Laboratory Safety session to be held in before beginning their chemistry laboratory classes in semester 2. Attendance at this session is compulsory.

Core Modules: The Core modules, one Trinity Elective and two Open modules specified below are mandatory. In the second semester, students have the choice of taking one of the specified Chemistry or Physics Open modules**.**

Assessment and Examination Procedures:
Modules may be assessed by end-of-semester examination and/or continuous assessment. Further information relating to the assessed components and composition of written papers will be given in the Junior Sophister Nanoscience Booklets issued to rising Junior Sophisters. Examined modules may include continuous assessment components. Junior Sophister marks contribute to 30% of the final degree Moderatorship mark.

The Junior Sophister course structure is diagrammatically illustrated below:

<table>
<tr><th colspan="3">Junior Sophister TR061 – NANOSCIENCE</th></tr>
<tr><th colspan="3">40 Credits core + 20 Credits Open modules or Trinity Elective modules</th></tr>
<tr><td rowspan="5">Core Modules (40 credits)</td><td>Semester 1: Core</td><td>Semester 2: Core</td></tr>
<tr><td>PYU33P01: Quantum Mechanics I (5 credits)</td><td>CHU33107: Organometallics and Coordination Chemistry (5 credits)</td></tr>
<tr><td>CHU33405: Analytical and Computational Methods (5 credits)</td><td>CHU33307: Solid State Materials and Modelling (5 credits)</td></tr>
<tr><td colspan="2">PYU33NP3: Nanoscience Physics Laboratory (10 credits)</td></tr>
<tr><td>CHU33409: Analytical and Computational Methods Workshops (5 credits)</td><td>CHU33603: Practical in Physical Chemistry and Nanoscience (5 credits)</td></tr>
<tr><td rowspan="4">Open or Trinity Elective Modules (20 credits)</td><td>Semester 1: Open modules both core</td><td>Semester 2: Open – choose 1 of 2 and Trinity Elective</td></tr>
<tr><td>* PYU33P03: Condensed Matter I (5 credits)</td><td>PYU33P04: Semiconductor Physics (5 credits)</td></tr>
<tr><td>* PYU33P02: Electromagnetic Interactions I (5 credits)</td><td>CHU33105: Chemistry of Polymers and Macromolecules (5 credits)</td></tr>
<tr><td>* Indicates a mandatory selection
No Trinity Elective available in Semester 1.</td><td>Trinity Elective (Nanoscience students obliged to take a TE in S2) (5 credits)</td></tr>
</table>

A Nanoscience student must take their one required Trinity Elective in Semester 2. In Semester 2 the choice of Open module is then between PYU33P04 (Semiconductor Physics) and CHU33105 (Chemistry of Polymers and Macromolecules).

A Nanoscience student cannot choose to take a second Trinity Elective. The requirement by College for these students for 10 Elective credits is met between the JS Trinity Elective in Semester 2 and the SF module in the History Philosophy and Ethics of Science.

4.3 Module Descriptors

Module Code	Sem	ECTS	Core/ Mandatory	Open	Title and Description	Assessment	Reassessment (Capped at 60%)
CHU33207	1	5	Chem CMM MedChem ChemBio	-	**Synthetic Organic Chemistry:** This module is aimed at achieving an understanding of fundamental reaction mechanisms of transition-metal-catalysed reactions, introducing the student to the different reactivities of organoheteroatom compounds and at providing the student with a grounding in the advanced selective oxidative and reductive transformations necessary to apply retrosynthetic analysis effectively.	Examination	Examination
CHU33209	1	5	Chem CMM MedChem ChemBio	-	**Practical in Organic Chemistry:**	Reports*	Reports and *viva voce*
CHU33303	1	5	Chem CMM MedChem ChemBio	-	**Quantum Mechanical Concepts in Physical Chemistry:** This module seeks to introduce the student to the fundamental aspects of quantum mechanics and the use of Schrödinger's equations to describe particle systems in chemistry.	Continuous Assessment (20%)* Examination (80%)	Continuous Assessment (20%) Examination (80%)
CHU33405	1	5	Chem CMM MedChem ChemBio Nano	-	**Analytical and Computational Methods:** This module introduces the student to instrumental methods in analytical chemistry and to modern computational tools to understand chemical structure and interpret spectroscopic results.	Examination	Examination
CHU33409	1	5	Chem CMM MedChem ChemBio Nano	-	**Analytical and Computational Methods Labs/Workshops:** This module introduces methods for data analysis and interpretation across all chemistry disciplines.	In class assessments & reports*	Reports and *viva voce*

Module Code	Sem	ECTS	Core/ Mandatory	Open	Title and Description	Assessment	Reassessment (Capped at 60%)
CHU33107	2	5	Chem CMM MedChem ChemBio Nano	-	**Organometallic and Coordination Chemistry:** This module aims to develop an understanding of the main methods of synthetic organometallic chemistry, fundamental structure-reactivity relationships, and concepts of bonding and structure, functional group chemistry, thermodynamics and kinetics.	Examination	Examination
CHU33109	2	5	Chem CMM MedChem	-	**Practical in Inorganic Chemistry**	Reports and Posters*	Reports, Posters, and *viva voce*
CHU33309	2	5	Chem CMM MedChem	-	**Practical in Physical Chemistry**	Reports, Posters, and *viva voce**	Reports, Posters, and *viva voce*
CHU33509	2	5	ChemBio	-	**Practical in Physical and Inorganic Chemistry for Chemistry with Biosciences**	Reports, Posters, and *viva voce**	Reports, Posters, and *viva voce*
CHU33603	2	5	Nano	-	**Practical in Physical and Inorganic Chemistry for Nanoscience**	Reports, Posters, and *viva voce**	Reports, Posters, and *viva voce*
CHU33105 †	2	5	-	Chem CMM Medchem ChemBio Nano	**Chemistry of Polymers and Macromolecules:** This module introduces the student to polymer and macromolecular chemistry. Polymer based materials are an important component of many devices and products.	Examination	Examination
CHU33205	2	5	MedChem	Chem CMM ChemBio	**Advanced Organic Transformations:** This module is aimed at achieving an advanced understanding of the reactivity of heterocyclic compounds, introducing the student to applications of molecular orbital theory for organic reactivity, and integrating physical chemistry principles into their understanding of organic chemistry reactions.	Examination	Examination

Module Code	Sem	ECTS	Core/ Mandatory	Open	Title and Description	Assessment	Reassessment (Capped at 60%)
CHU33307	2	5	CMM Nano	Chem MedChem ChemBio	**Solid State Materials and Modelling:** This module introduces the student to the fundamental aspects of solid-state materials and the modelling of them. It will focus on the electronic structure and defects and how these can be used to influence the properties of materials and hence create functional materials.	Continuous Assessment (50%)* Examination (50%)	Examination
CHU33442	2	5	MedChem	ChemBio	**Drug Design and Development:** This module is aimed at introducing the student to drug design and development with special focus on antivirals, antibiotics and therapeutics in cancer treatment. The student will also be introduced to the principles of QSAR in drug design.	Continuous Assessment (8.3%)* Examination (91.7%)	Continuous Assessment (8.3%)* Examination (91.7%)
BYU22206	2	5	ChemBio	-	**Microbes, Immune Systems and their Interaction:** The microbial world existed successfully for 1.5 billion years before multicellular organisms began to appear. During that time, microbes evolved multiple defence mechanisms against potential competitors. Even when multicellular organisms evolved, microbes continued to exist successfully, often in harmony. Many of these mechanisms are conserved in multicellular organisms and used in defence against potential pathogens. In this module, students will learn about immune systems that have evolved over billions of years and about the complex interactions between microbes and their hosts, which can lead to significant disease but which are also required for health. Students will learn about the molecular and cellular biology of key pathogens (viral, prokaryotic and eukaryotic) that currently threaten human populations; they will learn about immune systems and the diverse mechanisms used by immune molecules and cells to detect and respond to these microbes.	Continuous Assessment (30%) Examination (70%)	Examination

Module Code	Sem	ECTS	Core/ Mandatory	Open	Title and Description	Assessment	Reassessment (Capped at 60%)
BYU22207	2	5	ChemBio	-	**Genomes, Disease and Diversity:** Through lectures, and practicals (practice in techniques and problem-solving) we will provide students with a broad overview of the genomics and the impact of new approaches across the biosciences. We will introduce the basics of new technologies and show the application of these to the study of a) inherited traits, including Mendelian and complex human diseases; b) the non-inherited somatic genome with particular focus on cancer; c) human kinship and origins; d) the microbiome; and e) the genomics of ecology.	Continuous Assessment (30%) Examination (70%)	Examination
BYU33102	2	5	ChemBio	-	**From Organisms to Ecosystems:** Organisms to Ecosystems I aims to introduce students to the biology of individuals, species, populations and ecosystems, and explore how humans interact with other living organisms. It covers the developmental biology of organisms, their physiology, brain function and the evolutionary and ecological responses of organisms to their environment. Topics incorporate the diversity of life and its biological development, interactions between organisms and their environment, the biological context of climate change, human impacts on the environment, future food sustainability, urban ecology, ecosystem services and the value and conservation of biodiversity. Topics are arranged in three sections: 1) Multicellularity and Development, Physiology, Behavior and Neuroscience, 2) Evolution: Adaptation, Populations and Biodiversity, and 3) Ecology and Environment.	Continuous Assessment (20%) Examination (80%)	Examination
PYU33P01	1	5	Nano	-	**Quantum Mechanics:** This module covers solution of the Schrödinger Equation in specific topics, such as angular momentum and the hydrogen atom.	Examination	Examination

Module Code	Sem	ECTS	Core/ Mandatory	Open	Title and Description	Assessment	Reassessment (Capped at 60%)
PYU33P02	1	5	Nano	-	**Electromagnetic Interactions:** This module covers the fundamentals of electromagnetic theory together with quantum optics and lasers. (This module is mandatory for Institute of Physics accreditation.)	Examination	Examination
PYU33P03	2	5	Nano	-	**Condensed Matter:** This module introduces condensed matter concepts such as crystal structure and thermal and electronic properties of matter.	Examination	Examination
PYU33NP3	1 & 2	10	Nano	-	**Practical in Physics**	Reports, Posters, and *viva voce*	Reports, Posters, and *viva voce*
PYU33P04†	2	5		Nano	**Semiconductor Physics:** This module covers the physics of semiconductors and the construction, fabrication and application of semiconductor devices.	Examination	Examination
Electives‡	1/2	5	All		**See description below**		

* Junior Sophister Practicals will be assessed by continuous assessment. **Attendance** at chemistry practical classes is recorded and compulsory for students. **You must attend and submit more than two thirds of the required coursework for any module**. Unauthorized late submissions of coursework will result in a 10% reduction in marks for the first 24-hour delay and a 5% reduction per working day thereafter. At the end of teaching term students who have not satisfied these regulations may be reported as non-satisfactory for that term. Students whose attendance is reported as non-satisfactory may be refused permission to take their semester one or semester two examinations and may be required to repeat the year. Details of practical reporting requirements, related deadlines and the assessment process will be provided in the lab manual/Blackboard.

† Nanoscience students must choose between CHU33105 and PYU33P04 for their semester 2 open module.

‡ Chem/CMM/Medchem must choose an elective in Semester 1, and may choose a second elective in Semester 2. ChemBio must choose an elective in Semester 1 only. Nanoscience must choose an elective in Semester 2 only.

4.4 Coursework Requirements and Non-Satisfactory Attendance

All students must fulfil the course requirements of the school or department, as appropriate, with regard to attendance and course work. Where specific requirements are not stated, **students may be deemed non-satisfactory if they miss more than a third of their course of study or fail to submit a third of the required course work in any term**.

At the end of the teaching term, students who have not satisfied the school or department requirements may be reported as non-satisfactory for that term. Students reported as non-satisfactory for the Michaelmas and Hilary terms of a given year may be refused permission to take their semester two assessment/examinations and may be required by the Senior Lecturer to repeat the year.

Unauthorized late submissions of coursework will result in a 10% reduction in marks for the first 24-hour delay and a 5% reduction per working day thereafter.

Examination Information

Modules are assessed by continuous assessment and/or by examination. The Junior Sophister year carries a total of 60 credits. The distribution of marks between papers and practical work at the Sophister examinations will be published by individual schools or departments/disciplines.

Calculation of Moderatorship results

The final moderatorship results are calculated as a weighted average of the overall result for the Junior and Senior Sophister examination results, as follows:
Junior Sophister 30%, Senior Sophister 70%.

Reassessment Regulations

Reassessment is available in all years.
The right to reassessment of a module will be automatic for those students who receive a fail grade.
Reassessment marks will be capped at 60% for all TR061 modules.
Students may not present for reassessment in a module they have passed.

Repeat-Year regulations

Students who fail to satisfy the requirements of their year at the Reassessment session are required to repeat the year in full (i.e., all modules and all assessment components). Students are permitted to repeat any year of an undergraduate programme subject to not repeating the same year more than once and not repeating more than two academic years within a degree course, except by special permission of the University Council (see Calendar, https://www.tcd.ie/calendar/undergraduate-studies/general-regulations-and-information.pdf).

The option to repeat a year on an 'off-books' basis will be at the discretion of the Senior Lecturer.

Examination Regulations – Junior Sophister

Examination timetables will be published on the portal my.tcd.ie at least four weeks prior to examinations taking place.

The College reserves the right to alter the published time and date of an examination in exceptional circumstances. Students should ensure that they are available for examinations for the duration of the relevant examination session as stated in the Almanack.

Junior Sophister students must, in the first instance, sit the end-of-semester examinations and meet the requirements of the course.

The Junior Sophister examination has a two-fold purpose. It is (a) the final examination for the Ordinary B.A. degree and (b) a qualifying examination to proceed to the Senior Sophister year as a Moderatorship candidate. A student who rises to, and completes, the Senior Sophister year, but fails the Moderatorship examination, is still qualified for the award of an Ordinary B.A. degree based on their successful performance in the Junior Sophister examination.

Students who pass the Junior Sophister examination can have the Ordinary B.A. degree conferred if they do not choose to proceed to Moderatorship. Except by special permission of the University Council, on the recommendation of the Course Director, the ordinary degree of B.A. may be conferred only on candidates who have spent at least three years in the course.

This following extract is taken from the general regulations and information section of the 2024/25 College Calendar:

67 In order to rise with their class, students must obtain credit for the academic year by satisfactory attendance at lectures and tutorials and by carrying out, submitting and sitting the required assessment components. In addition, students must pass the year by achieving, at a minimum, an overall credit-weighted average pass mark for the year (40 per cent or 50 per cent, as per programme regulations) and either:

(a) accumulate 60 credits by achieving at least the pass mark in all modules or
(b) **Pass by Compensation.** All modules and components within modules are compensatable (except in particular professional programmes where compensation does not apply). To pass a year by compensation, in programmes that locate the pass mark at 40 per cent, a student must achieve the pass mark in modules carrying a minimum of 50 credits and obtain a

module mark of at least 35 per cent in any remaining module(s). A student may accumulate a maximum of 10 credits at qualified pass where the mark lies between 35-39 per cent.

The end of year or degree result moderated by the court of examiners must be returned and recorded on the student record.

68 Progression is on an annual basis. Within a year students may carry failed modules from one semester to the next but not from one academic year to another; that is, they will not be able to rise to the next year of their programme until they have successfully completed the preceding year(s). Students who have not passed their year are required to present for reassessment when:

(a) they obtain in excess of 10 credits at qualified pass (i.e. marks between 35-39 per cent where the pass mark is 40 per cent;

(b) they fail any module (i.e. achieving marks below 35 per cent where the pass mark is 40 per cent; or below 45 per cent where the pass mark is 50 per cent);

(c) they do not obtain an overall pass mark for the
year; (d) any combination of (a) - (c) occurs.

69 If a student has achieved both fail and qualified pass grades at the first sitting or has exceeded the 10 credit limit allowed for compensation and is not permitted to rise with their year, they must present for reassessment in all failed components of all modules for which they obtained a fail and/or a qualified pass.

70 Different modalities of assessment to the first sitting are permitted in the reassessment session as determined by the programme.

71 The same compensation regulations as outlined above apply at the reassessment session.

72 Students who fail to satisfy the requirements of their year at the reassessment session are required to repeat the year in full (i.e. all modules and all assessment components).

73 Students are permitted to repeat any year of an undergraduate programme6 subject to not repeating the same year more than once and not repeating more than two academic years within a degree course, except by special permission of the University Council.

74 The maximum number of years to complete an undergraduate degree is six years for a standard four-year programme and seven years for a five-year programme.

75 Under certain conditions approved by the University Council, on the recommendation of the Senior Lecturer in consultation with the appropriate head(s) of school(s), director(s) of undergraduate teaching and learning, head(s) of department(s), Associate Dean for Undergraduate Science Education or course director, the University regards attendance at courses and the passing of approved examinations in other colleges as fulfilling or partially fulfilling the exercises required for certain degrees of the University. Where places are available students may be permitted advanced entry to their course, if they are deemed qualified by their knowledge and attainment to do so, or by passing specified examinations. Applicants must pay a fee before presenting themselves for examination (see COLLEGE CHARGES). Applications for
advanced entry to any course should be made through the Academic Registry in the first instance.

76 Students must pursue their undergraduate course continuously unless they are permitted by the Senior Lecturer to interrupt it, normally for a period of one year, either by going 'off-books' or by intermitting their studies for extra-curricular reasons.

4.5 Attendance Requirements

Laboratory practical work is assessed in-course. **Attendance** at chemistry practical classes is compulsory for students. **You may be deemed non-satisfactory if you fail to attend and/or submit more than a third of the required coursework for any module**.

In order to reinforce and extend a student's laboratory skills in Chemistry, rising Junior Sophister students **are required** to attend a day-long workshop on Safety, which is held in Fresher's Week (i.e., the week before lectures start) of Michaelmas Term. Attendance at all workshops **is compulsory**.

Reference/Source:

Calendar Part II, B: General Regulations and Information, 'Attendance'

Absence from Examinations

(taken from Calendar general regulations and information)

44 Students who may be prevented from sitting an examination or examinations (or any part thereof) due to illness should seek, through their tutor, permission from the Senior Lecturer in advance of the examination session to defer the examination/s to the reassessment session. Students who have commenced the examination session, and are prevented from completing the session due to illness should seek, through their tutor, permission from the Senior Lecturer to defer the outstanding examination/s to the reassessment session.
45 Where such permission is sought, it must be appropriately evidenced:

(a) For illness: medical certificates must state that the student is unfit to sit examinations/ complete assessment and specify the date(s) of the illness and the dates on which the student is not fit to sit examinations/complete assessment. Medical certificates must be submitted to the student's tutor within three days of the beginning of the period of absence from the assessment/examination.
(b) For other grave cause: appropriate evidence must be submitted to the student's tutor within

three days of the beginning of the period of absence from the assessment/examination.

46 Where illness occurs during the writing of an examination paper, it should be reported immediately to the chief invigilator. The student will then be escorted to the College Health Centre. Every effort will be made to assist the student to complete the writing of the examination paper.
47 Where an examination/assessment has been completed, retrospective withdrawal will not be

granted by the Senior Lecturer nor will medical certificates be accepted in explanation for poor performance.

Reference/Source:

Calendar Part II, B: General Regulations and Information, 'Absence'

Academic Policies

Student Feedback and Evaluation

The courses offered by the School benefit from student feedback. Rather than waiting until the end of a module to request online feedback, the School of Chemistry has instituted a Sophister Liaison Committee (SLC). Committee members comprise the DTLUG/Associate DTLUG, the School Convenor, JS and SS class reps, and Heads of Discipline or their representatives and the meetings are minuted. Class reps should collate feedback from their fellow students to bring to the meeting, which takes place at least once per semester.