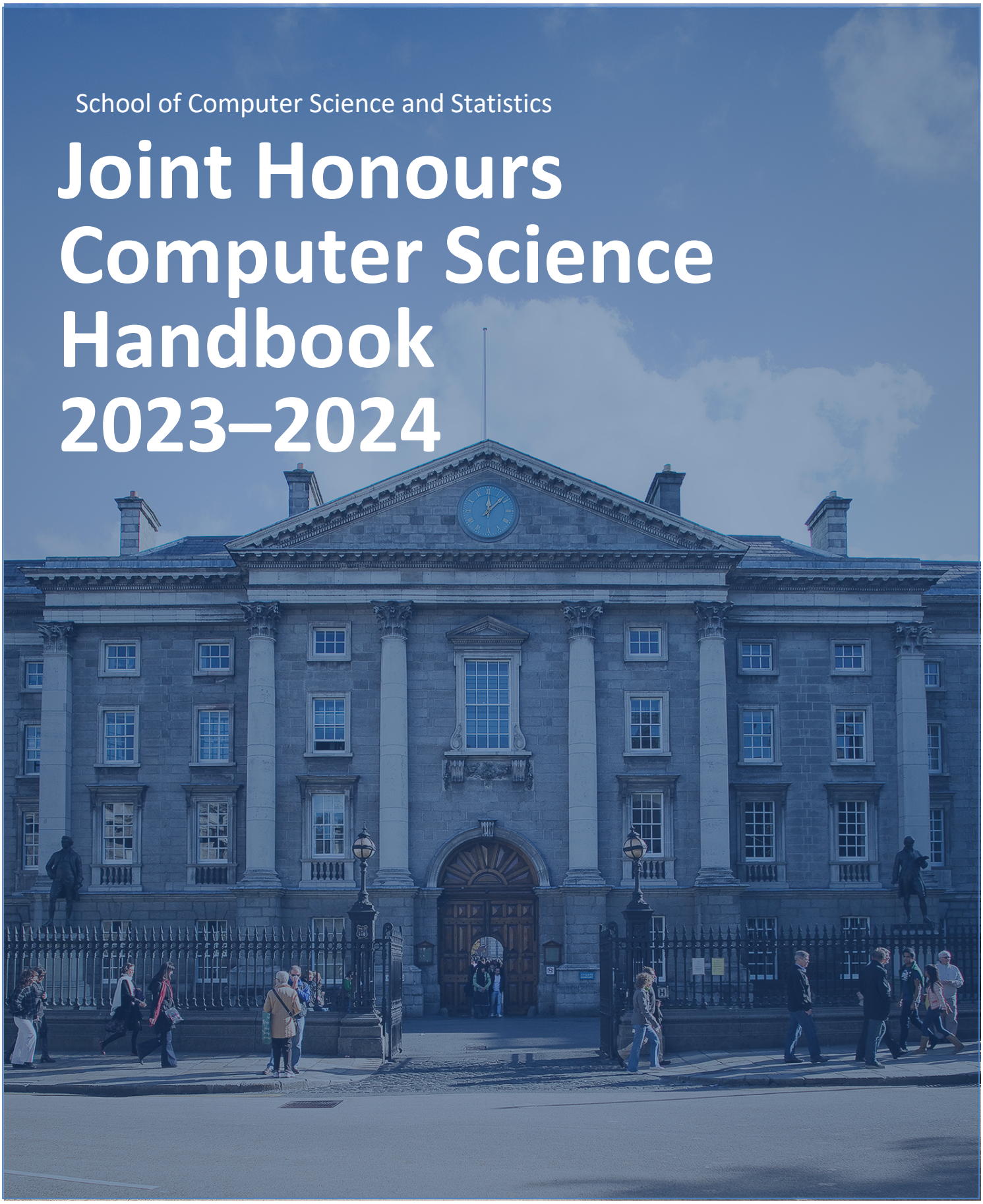
Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

School of Computer Science and Statistics

Joint Honours Computer Science Handbook 2023–2024



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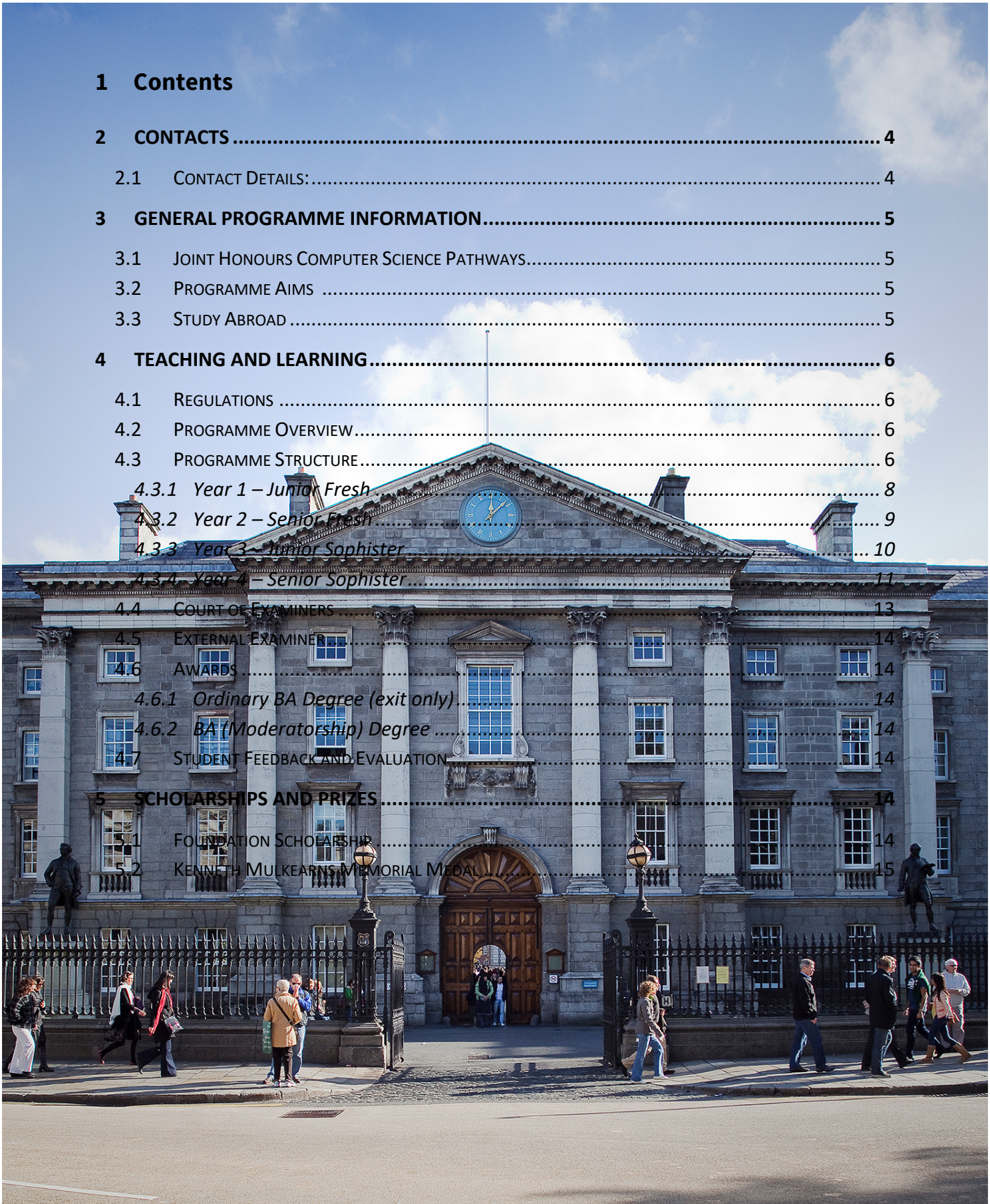


1 Contents

2 CONTACTS 4

2.1 Contact Details: 4

3 GENERAL PROGRAMME INFORMATION 5

3.1 Joint Honours Computer Science Pathways 5
3.2 Programme Aims 5
3.3 Study Abroad 5

4 TEACHING AND LEARNING 6

4.1 Regulations 6
4.2 Programme Overview 6
4.3 Programme Structure 6
4.3.1 Year 1 – Junior Fresh 8
4.3.2 Year 2 – Senior Fresh 9
4.3.3 Year 3 – Junior Sophister 10
4.3.4 Year 4 – Senior Sophister 11
4.4 Court of Examiners 13
4.5 External Examiner 14
4.6 Awards 14
4.6.1 Ordinary BA Degree (exit only) 14
4.6.2 BA (Moderatorship) Degree 14
4.7 Student Feedback and Evaluation 14

5 SCHOLARSHIPS AND PRIZES 14

5.1 Foundation Scholarship 14
5.2 Kenneth Mulkearns Memorial Medal 15

Welcome
This handbook contains information and regulations for Joint Honours Computer Science students.

It provides a guide to what is expected of you on this programme. It should be read in conjunction with the SCSS undergraduate handbook, which covers information common to all undergraduates on SCSS programmes, and the handbook for the other subject in your Joint Honours programme.

We are confident that you will find the Computer Science Joint Honours programme challenging and demanding and we hope that you will find your studies at Trinity College Dublin both stimulating and rewarding. Our programme has several features which we believe will contribute to your studies being an effective and enjoyable period of personal and academic development. If you are a new student to university, it is strongly recommended that you meet your tutor as he or she is your advocate in College and can also provide you with support should you have any difficulties.

We wish you every success in the coming year.

Notes
Information provided in this handbook is believed to be accurate at the time of preparation. Please note that, in the event of any conflict or inconsistency between the General Regulations published in the University Calendar and information contained in course handbooks, the provisions of the General Regulations will prevail. The University Calendar is available at http://www.tcd.ie/calendar/.

This handbook is available from the School of Computer Science and Statistics website. The handbook is subject to change.

"This Programme Handbook should be read in conjunction with the School of Computer Science and Statistics Undergraduate Student Handbook, which you can find on our website (teaching.scss.tcd.ie)."

2 Contacts

2.1 Contact Details:

Joint Honours Computer Science Director:
TBD

Course Administrator:
TBD

The School of Computer Science Reception
The School reception office is beside Room G.8 in the O'Reilly Institute (ORI).

Opening hours: During lecture terms:
9:15am-11:00am,
11:30am-1:00pm and
2:00pm-4:30pm

Tel: (01) 896 1765,
E-mail: teaching-unit@rt.scss.tcd.ie ,
Web: https://teaching.scss.tcd.ie/
Address: School of Computer Science and Statistics,
O'Reilly Institute,
Trinity College Dublin,
Dublin 2,
Ireland.

3 General Programme Information

The Joint Honours Computer Science (JH CS) programme is part of the Trinity Joint Honours (TJH) course, which is a four-year course leading to an honour's degree. Information about the TJH course can be found at https://www.tcd.ie/tjh.

Computer Science can be studied as a Joint Honours subject with Business, Economics, Geography, or Linguistics. More details about the JH CS programme, and updates to this handbook, can be found at SCSS Joint Honours CS pages

3.1 Joint Honours Computer Science Pathways

Depending on student choices made during the programme students may exit with a Joint Honours award, with a Major in Computer Science and Minor in the other subject, or with a Major in the other subject and Minor in Computer Science. The only possible Single Honours exits from combinations with Computer Science are Single Honours in Geography and Single Honours in Economics.

3.2 Programme Aims

The aim of the programme is to equip its graduates with the knowledge, skills, and experience to be able to:

- Develop and apply computer systems from a broad base of knowledge in mathematics, computer science and human factors.
- Identify and formulate advanced technical challenges and demonstrate judgement to design appropriate computer science solutions.
- Design systems, components, or processes to meet specified functional objectives and to measure and analyse performance against these objectives.
- Understand and express the role of computer science in the community including the need for high standards of ethical behaviour and professional responsibility.
- Work effectively, independently and within multidisciplinary teams, and act as a mentor in team settings and engage in lifelong learning.
- Communicate effectively both professionally with other computing professionals and with the wider community.
- Participate in contemporary research activity as appropriate and demonstrate the knowledge and skills needed to undertake independent research.

3.3 Study Abroad

See the SCSS Undergraduate handbook for details on study abroad. Note that to study abroad Computer Science Joint Honours students must achieve an overall II.1 standard in the Junior Fresh year of the Computer Science subject but will otherwise be subject to overall College study abroad requirements and any additional requirements specified for the other subject. Note that Joint Honours students will need to consult with and get approval from both departments/schools for their proposed studies abroad.

4 Teaching and Learning

4.1 Regulations

The **College Calendar**, which is published annually at the beginning of each academic year, online at https://www.tcd.ie/calendar/undergraduate-studies/ contains additional **General Regulations** that apply to all degree programmes in the University. The regulations governing TJH students taking Computer Science are as for all TJH students, also found in the College Calendar. For modules delivered by the School of Computer Science and Statistics, additional rules apply as laid out in the SCSS UG Handbook. For example, the SCSS UG handbook details regulations about attendance, late submission and non-submission of coursework, plagiarism, and absence from examinations. Read the relevant sections now and whenever you are in any doubt about the rules. You are expected to be aware of the various regulations; ignorance is not a valid reason for failure to comply. Don't depend on what your classmates tell you – read the rules for yourself.
If any discrepancy exists between the regulations in the SCSS UG handbook, this document and the College Calendar, the College Calendar takes precedence.

4.2 Programme Overview

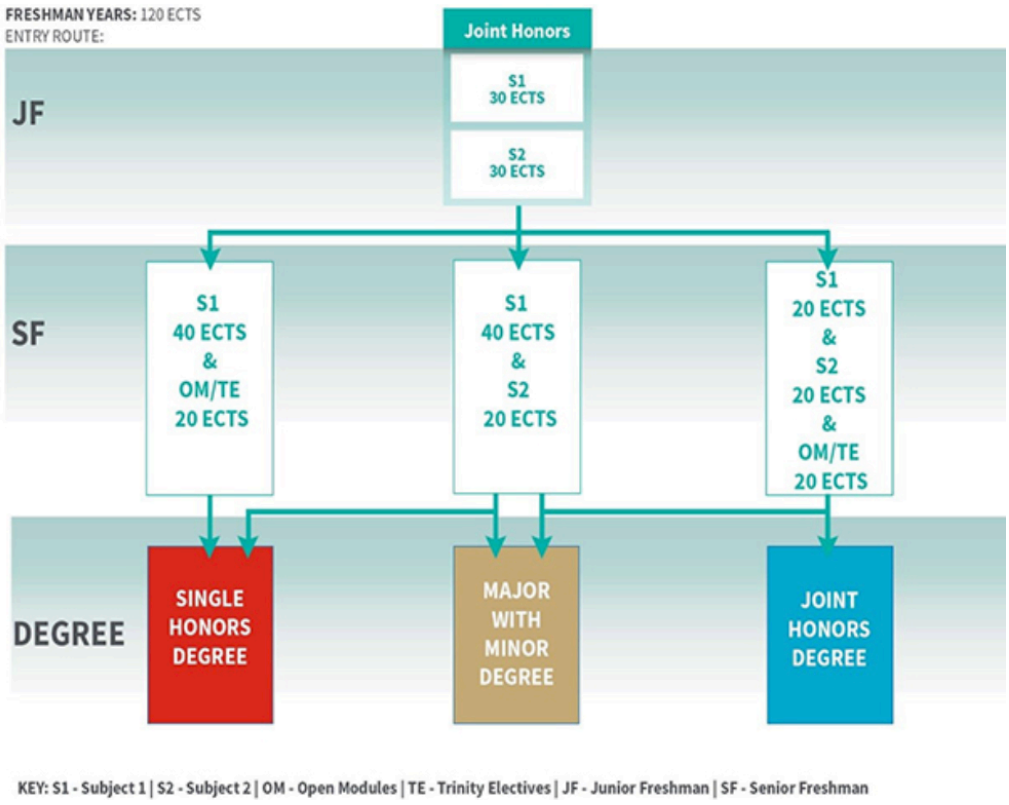
The Joint Honours Computer Science programme provides students with a solid foundation in Computer Science. The core programme ensures that graduates have the knowledge, skills, and experience to design and develop computer software, individually and as part of a team. Those majoring in Computer Science cover more advanced topics and have an opportunity to choose subjects that interest them.

4.3 Programme Structure

Trinity Joint Honours courses follow the structure depicted below and at https://www.tcd.ie/tjh/prospectivestudents/pathways/.

Students may exit with a Joint Honours award, with a Major in Computer Science and Minor in the other subject, or with a Major in the other subject and Minor in Computer Science. The only possible Single Honours exits from combinations with Computer Science are Single Honours in Geography and Single Honours in Economics. Those entering Joint Honours Computer Science do not have the option to exit with Single Honours in Computer Science. Furthermore, it is not possible to exit from Computer Science and Business with Single Honours in Business; nor is it possible to exit with Single Honours in Linguistics. Available pathways are subject to change and may be dependent on capacity.

In each academic year full-time undergraduate students at Trinity College must complete 60 ECTS credits. For Joint Honours students these credits are spread across Computer Science, the other subject, and optionally Trinity Electives or Open Modules in second year.



Overview

In Junior Fresh, students take 30 mandatory credits in Computer Science and 30 credits in their second subject. Students take a module in statistics (STU11002 Statistical Analysis I) unless their other subject includes an equivalent study of statistics in Year 1, in which case they will take CSU11022 (Introduction to Computing II) instead. (In 2023-24, JH CS students taking Business and those taking Economics don't take our Statistics, and so take CSU11022.)

In Year 2, students may take:

a) 40 credits in Computer Science and 20 credits in their second subject
b) 20 credits in Computer Science and 40 credits in their second subject
c) 20 credits in Computer Science, 20 credits in their second subject and 20 credits of Open Modules and Trinity Electives

In Year 3, students choose to study for:

(a) Major degree in Computer Science with a Minor in the second subject
(b) Joint Honours degree in Computer Science with the second subject
(c) Minor degree in Computer Science with a Major in the second subject

It is important to note that there is no opportunity to change your pathway between Junior Sophister and Senior Sophister year.

Students studying for a Joint Honours award will take:

- 30 credits in both Computer Science and the second subject in Year 3
- 20 credits in both Computer Science and the second subject in Year 4
- 20 credit capstone project in either Computer Science or the second subject in Year 4 (or a multi-disciplinary capstone project in both subjects)

Students studying for a Major in Computer Science may either:

- study both Computer Science and their second, Minor subject over Years 3 and 4. (This is known as Option A.) In this case, students will take:
    - 40 credits in Computer Science and 20 credits in the Minor subject in Year 3
    - 20 credits in Computer Science and 20 credits in the Minor subject in Year 4
    - 20 credit Computer Science capstone project in Year 4
- complete the Minor subject in Year 3 and study only the Major subject in Year 4. (This is known as Option B.) In this case, students will take:
    - 30 credits in Computer Science and 30 credits in the Minor subject in Year 3
    - 40 credits in Computer Science in Year 4
    - 20 credit Computer Science capstone project in Year 4

Students studying for a Minor in Computer Science may either:

- continue to study Computer Science in Year 3 and Year 4, taking 20 credits in Computer Science in each year (Option A).
- complete their study of Computer Science by taking 30 credits in Year 3 and studying only their Major subject in Year 4 (Option B).

Computer Science modules in each year are shown below. Brief descriptions of the programme modules are provided on the relevant year page of the course website https://teaching.scss.tcd.ie/joint-honours-computer-science/. Full details, including learning outcomes, pre-requisites, book recommendations and important evaluation and assessment criteria are available through module links on those pages, or at http://my.tcd.ie.

During the Trinity term of each year students will be invited to register their preferences for the following year of their course, including Trinity Electives and Open Modules. Students will be advised of how to do this, and of where they will find relevant module information several weeks before they are invited to register. Timetabling may restrict the availability of modules to individual students.

4.3.1 Year 1 – Junior Fresh

In year 1 (Junior Fresh) all JH CS students take the following mandatory modules in addition to what is required for their other subject:

Year 1 JH Computer Science and BUSINESS and JH Computer Science and Economics
Operational From: 2021/2022

Michaelmas Term	Hilary Term
Mathematics I CSU11001 (5 credits)	Programming Project CSU11013 (5 credits)
Introduction to Computing I CSU11021 (5 credits)	Introduction to Computing II CSU11022 (5 credits)
Introduction to Programming I CSU11011 (5 credits)	Introduction to Programming II CSU11012 (5 credits)

Year 1 JH Computer Science and GEOGRAPHY and JH Computer Science and Linguistics	
Operational From: 2021/2022	
Michaelmas Term	**Hilary Term**
Mathematics I CSU11001 (5 credits)	Programming Project CSU11013 (5 credits)
Introduction to Computing I CSU11021 (5 credits)	Introduction to Programming II CSU11012 (5 credits)
Introduction to Programming I CSU11011 (5 credits)	Statistical Analysis I STU11002 (5 credits)

4.3.2 Year 2 – Senior Fresh

In Year 2, students may take:

a) 40 credits in Computer Science and 20 credits in their second subject
b) 20 credits in Computer Science and 40 credits in their second subject or
c) 20 credits in Computer Science, 20 credits in their second subject and 20 credits of Open Modules and Trinity Electives*

All modules are subject to change. Students must ensure that they have a balance of 30 ECTS credits for each semester.

Note that your choice in Year 2 may limit your pathways from Year 3; to exit with Single Honours (available to Geography and Economics only), you will need to take 40 ECTS of that subject in second year. But even if you take only 20 ECTS in CS in Year 2 you can proceed to Major in Computer Science.

* Consult www.tcd.ie/trinity-electives/electives/ and programme specific open modules list at www.tcd.ie/tjh/open-modules/

Year 2	
Operational From: 2020/2021	
Michaelmas Term	**Hilary Term**
20 credits	
Algorithms and Data Structures I CSU22011 (5 credits)	Mathematics II CSU12002 (5 credits)
Information Management I CSU22041 (5 credits)	Software Engineering Project I CSU22013 (5 credits)
+ 20 credits (total 40 credits in Computer Science)	
Applied Statistics and Probability I STU22004 (5 credits)	Algorithms and Data Structures II CSU22012 (5 credits)
SCSS ELECTIVE MODULE (5 credits)	SCSS ELECTIVE MODULE (5 credits)
Open Modules	
SCSS Elective Modules:	
Systems Programming CSU22014 (5 credits) prerequisite: CSU11022	Concurrent Systems and Operating Systems CSU23016 (5 credits) prerequisite: CSU22014 or CSU22061
Intermediate Programming CSU22061 (5 credits)	Natural Language Processing CSU22062 (5 credits) prerequisite: CSU22061

4.3.3 Year 3 – Junior Sophister

In third year, students will take 20, 30 or 40 ECTS in Computer Science depending on the desired exit option. See Overview above.

All modules are subject to change. Students must ensure that they have a balance of 30 ECTS credits for each semester.

Year 3 Major or Joint Honors in Computer Science	
Operational From: 2021/2022	
Michaelmas Term	**Hilary Term**
30 credits (Major and Joint Honors in Computer Science)	
Software Engineering CSU33012 (5 credits)	Software Engineering Project II CSU33013 (5 credits)
Computer Networks CSU33031 (5 credits)	Information Management II CSU34041 (5 credits)
SCSS ELECTIVE MODULE (5 credits)	SCSS ELECTIVE MODULE (5 credits)
+ 10 credits (Major in Computer Science only and continuing Minor subject in Year 4)	
SCSS ELECTIVE MODULE (5 credits)	SCSS ELECTIVE MODULE (5 credits)
SCSS Elective Modules:	
Symbolic Programming CSU34011 (5 credits)	Artificial Intelligence I CSU33061 (5 credits)
Introduction to Functional Programming CSU34016 (5 credits)	Advanced Computer Networks CSU33032 (5 credits)
Computational Mathematics CSU33081 (5 credits) prerequisites: CSU11001 or CSU12002 or MAU22C00 or MAU11601	Compiler Design I CSU33071 (5 credits)

Year 3 Minor in Computer Science	
Operational From: 2021/2022	
Michaelmas Term	**Hilary Term**
20 credits	
Software Engineering CSU33012 (5 credits)	Software Engineering Project II CSU33013 (5 credits)
Computer Networks CSU33031 (5 credits)	Information Management II CSU34041 (5 credits)
+ 10 credits (if completing Minor in Computer Science in Year 3)	
SCSS ELECTIVE MODULE (5 credits)	SCSS ELECTIVE MODULE (5 credits)
SCSS Elective Modules:	
Symbolic Programming CSU34011 (5 credits)	Artificial Intelligence I CSU33061 (5 credits)
Introduction to Functional Programming CSU34016 (5 credits)	Advanced Computer Networks CSU33032 (5 credits)
Computational Mathematics CSU33081 (5 credits) prerequisites: CSU11001 or CSU12002 or MAU22C00 or MAU11601	Compiler Design I CSU33071 (5 credits)

4.3.4 Year 4 – Senior Sophister

In year 4, all students must complete a capstone project (known as a "Final Year Project" in SCSS) worth 20 ECTS. For those wishing to exit with a Major in Computer Science the capstone must be in Computer Science. For the remaining 40 ECTS the balance between subjects depends on the path taken in previous years, and the desired exit option. See Overview section above.

For information about the Computer Science Final Year Project (CSU44099), visit https://projects.scss.tcd.ie/

All modules are subject to change. Students must ensure that they have a balance of 30 ECTS credits for each semester.

<table>
<tr><td colspan="2">Year 4 Major or Joint Honors in Computer Science</td></tr>
<tr><td colspan="2">Operational From: 2022/2023</td></tr>
<tr><td colspan="2">Joint Subjects: Business, Geography</td></tr>
<tr><td>Michaelmas Term</td><td>Hilary Term</td></tr>
<tr><td colspan="2">20 credits</td></tr>
<tr><td colspan="2">ELECTIVE MODULES
(20 credits)</td></tr>
<tr><td colspan="2">+ 20 credits (Major in Computer Science only, if Minor subject was completed in Year 3)</td></tr>
<tr><td colspan="2">ELECTIVE MODULES
(20 credits)</td></tr>
<tr><td colspan="2">+ 20 credits (Major in Computer Science or
Joint Honors in Computer Science taking Capstone in Computer Science)</td></tr>
<tr><td colspan="2">Final Year Project
CSU44099 (20 credits)</td></tr>
<tr><td colspan="2">SCSS Elective Modules:</td></tr>
<tr><td>Human Factors
CSU44051 (5 credits)</td><td>Group Design Project
CSU44098 (10 credits)</td></tr>
<tr><td>Fuzzy Logic & Control Systems
CSU44001 (5 credits)</td><td>Entrepreneurship & High-Tech Venture Creation
CSU44081 (5 credits)</td></tr>
<tr><td>Formal Verification
CSU44004 (5 credits)</td><td>Knowledge Representation and Automata
CSU44060 (5 credits)</td></tr>
<tr><td>Topics in Functional Programming
CSU44012 (5 credits)
prerequisite: CSU34016</td><td></td></tr>
<tr><td>Internet Applications
CSU44000 (5 credits)</td><td></td></tr>
<tr><td>Computer Graphics
CSU44052 (5 credits)</td><td></td></tr>
<tr><td>Computer Vision
CSU44053 (5 credits)</td><td></td></tr>
<tr><td>Machine Learning
CSU44061 (5 credits)</td><td></td></tr>
<tr><td>Advanced Computational Linguistics
CSU44062 (5 credits)</td><td></td></tr>
<tr><td colspan="2">Strategic Information Systems
STU45006 (10 credits)</td></tr>
</table>

Year 4 Minor in Computer Science	
Operational From: 2022/2023	
Joint Subjects: Business, Geography	
Michaelmas Term	**Hilary Term**
0 credits (if Minor in Computer Science was completed in Year 3)	
20 credits (if continuing Minor in Computer Science in Year 4)	
COMPUTER SCIENCE ELECTIVES (20 credits)	
Open Modules	
Elective Modules:	
Human Factors CSU44051 (5 credits)	Entrepreneurship & High-Tech Venture Creation CSU44081 (5 credits)
Fuzzy Logic & Control Systems CSU44001 (5 credits)	Group Design Project CSU44098 (10 credits)
Formal Verification CSU44004 (5 credits)	Knowledge Representation and Automata CSU44060 (5 credits)
Topics in Functional Programming CSU44012 (5 credits) prerequisite: CSU34016	
Internet Applications CSU44000 (5 credits)	
Computer Graphics CSU44052 (5 credits)	
Computer Vision CSU44053 (5 credits)	
Machine Learning CSU44061 (5 credits)	
Advanced Computational Linguistics CSU44062 (5 credits)	
Strategic Information Systems STU45006 (10 credits)	

Please note that not all electives may run in a given year, depending on demand and availability of appropriate staff to teach the electives.

Students may change options by informing the Teaching Unit up to the end of the second week of Michaelmas Term. Late changes will not be accepted.

4.4 Court of Examiners

Joint Honours students' Computer Science module marks are considered at a Court of Examiners in the School of Computer Science and Statistics. Agreed marks are then passed to the Trinity Joint Honours Court of Examiners where the CS marks are considered alongside the marks in the other subject, where overall decisions about progression (to the following year), degree award and TJH prizes are made.

4.5 External Examiner

The external examiner for the JH CS programme is Prof Omar F. Rana from Cardiff University. The external examiner will be involved in ensuring that the examinations in third and fourth year are run properly (in terms of how the exam papers are set and marked, and how the results are moderated).

4.6 Awards

4.6.1 Ordinary BA Degree (exit only)

Students who have passed their Year 3 examinations may have an ordinary BA degree conferred if they do not choose, or are not allowed, to proceed to Year 4 of the programme, or if they fail to complete satisfactorily Year 4 of the course. Except by permission of the University Council, an ordinary BA degree may be conferred only on candidates who have spent at least two years in the University.

4.6.2 BA (Moderatorship) Degree

The BA (Moderatorship) degree is awarded if a student has successfully completed Years 3 and 4. The final degree award is calculated from the final two years' results - Year 3 is weighted at 30% and Year 4 is weighted at 70% of the overall degree award. Where students are awarded an honours degree, the class of degree awarded is based on the weighted average mark achieved as follows: First Class Honours: 70%–100%, Second Class Honours, First Division: 60%–69%, Second Class Honours, Second Division: 50%–59%, Third Class Honours: 40%–49%.

Depending upon student choices made within the programme of study the Bachelor in Arts (Moderatorship) award will be in one of the following categories:

Joint Honours
Major with Minor
Single Honours (in Geography and Economics only)

4.7 Student Feedback and Evaluation

The School will conduct student surveys of modules on a regular basis (at least once every three years) typically around the middle of the semester and will provide feedback on the results of these surveys as soon as practical. It will also facilitate student fora with the class representatives towards the end of each semester.

5 Scholarships and Prizes

In addition to prizes mentioned in the SCSS Undergraduate handbook, the prize detailed in section 5.2 is specific to the Joint Honours Computer Science programme.

5.1 Foundation Scholarship

Foundation scholarship ("Schol") is a College institution with a long history and high prestige. Those who become Scholars get fees, accommodation, and a stipend. The examinations for "Schol" are normally taken in your second (SF) year. Further information is available at https://www.tcd.ie/academicregistry/exams/scholarship/ and, for JH students, from the Undergraduate Common Architecture Office at www.tcd.ie/tsm-tjh.

5.2 Kenneth Mulkearns Memorial Medal

Irish Life Assurance plc founded a prize in 1992 in memory of Kenneth Mulkearns. A silver medal is awarded annually (until 2024 at least) to the student who is placed first in the fourth year of B.A. in Computer Science and Business degree examination. (After 2024 the criteria will change.)